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ABSTRACT

This workshop attended by 21 participants from 13 countries was designed to promote the use of computerized information and documentation services in the eastern and southern African subregion, and increase the exchange of experiences of the personnel involved in the field. The full text is provided for the following papers presented at the workshop: (1) "PADIS (Pan-African Documentation and Information System) Training Program--Objectives and Coverage" (F. K. Inganji); (2) "DSE's (German Foundation for International Development) Contributions towards Training of Information Personnel" (L. Huttemann); (3) "Introduction to PADIS-DEV (Socio-Economic Development Component)" (B. Teshager); (4) "Background Paper for INFOTERRA Briefing" (W. Y. Lee); (5) "The Population Information Network for Africa (POPIN-Africa)" (P. G. Amonoo); (6) "MINISIS--An Integrated Set of Information Systems for Information Retrieval and Library Management" (K. T. Mavuba); (7) "PADIS without Computerization" (F. K. Inganji); (8) "Information Management Using Microcomputers--The Experience of ICRAF (International Council for Research in Agroforestry)" (R. Labelle); (9) "Data Base Management" (K. T. Mavuba); (10) "Electronic Data Processing as a Tool for Smaller Information Units" (B. Brodmeier); (11) "Problems of Automating Libraries in a Developing Country--Kenya" (J. Were); (12) "User Needs and the PADIS System" (F. K. Inganji); and (13) "Regional Cooperation in Information Work" (F. K. Inganji). Analyses of participant presentations and of questionnaires completed by workshop participants are also provided. Appendices include a listing of participants and resource persons, the workshop program, a diagram of HABITAT (United Nations Center for Human Settlements) software applications, and a PADIS status report. (KM)

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DSE

Training Workshop on

USE OF COMPUTERS IN INFORMATION HANDLING

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21. April – 2. May, 1986

Nairobi, Kenya

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PADIS

PAN - AFRICAN DOCUMENTATION AND INFORMATION SYSTEM 2

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Lutz Hüttemann and Francis K. Inganji (Eds.)

USE OF COMPUTERS IN INFORMATION HANDLING

Report of the DSE/PADIS Training Workshop
held from 21. April to 2. May, 1986
in Nairobi, Kenya

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PREFACE

With the increase in the volume of information to be processed in various information and documentation centres in Africa, computer technology is becoming increasingly important. Bearing the importance of computer technology in information handling, the Pan African Documentation and Information System (PADIS), and the German Foundation for International Development (DSE), organised this training workshop in Nairobi (Kenya), for ten working days in late April, 1986.

The opening of this workshop was conducted by Dr. J. Omusse on behalf of Dr. Fred Wangati, the Secretary to the National Council for Science and Technology, Kenya. In his speach, Dr. Wangati stated that the exchange of scientific information both within Africa and between Africa and other countries using the computer is expected to bear fruit at relatively low cost. He further reiterated that Africa expects PADIS and DSE to play a major role in this endeavour and assist African scientists to communicate better.

Commenting on the role expected of PADIS in carrying out its duties, he suggested that PADIS should give attention to the creation of scientific information directories to stimulate and facilitate information retrieval and exchange at national, regional and international levels. These directories, stated Dr. Wangati, play an important role in promoting greater interaction among specialists and experts in science and technology as well as those who are involved in managing the information systems.

He further stated that member States participating in PADIS will need demonstration facilities to allow their information users and personnel to gain experience and confidence in using and managing computerised systems, giving them ample opportunities to adapt the systems to meet their user's needs and thereby ensuring proper appreciation and optimal use of the African region-wide information system. He therefore saw the establishment of such facility as a

worthwhile endeavour by PADIS. In this regard, he pointed out further that member States in PADIS will need to be consulted from time to time on specific guidelines relating to the acquisition, development and maintenance of computer hardware and software for use by PADIS so as to harmonise the user and technological needs of the various member States.

The workshop content consisted of:

a) Discussion papers and lectures;
b) Practical work, especially in relation to PADIS methodologies;
c) Field visits, to the United Nations Environmental Programme (UNEP) and the United Nations Centre for Human Settlements (HABITAT).

Field visits were arranged in order to give the participants a chance to learn about the information processing techniques of these organizations, and the hardware and software configuration in place. Of particular mention was the lecture and demonstration given by HABITAT regarding the (iv+v) software which has been acquired by HABITAT.

Both organizing institutions. PADIS and DSE, considered the training workshop in Nairobi as a pilot programme in two aspects:

a) to develop joint courses on a cost-sharing basis for training of target groups in which both institutions have an interest, in this case personnel from information and documentation establishments, and
b) to embark on training programmes emphasizing the use of computers in information work, in this case especially related to the PADIS system and its methodology.

The overall aim of the training workshop consisted of the promotion of computerized information and documentation services in the Eastern and Southern African sub-Region, leading to an increased exchange of experience of the involved personnel in this field.

The workshop was attended by 21 participants from 13 countries of the sub-region. We hope that it served as an eye-opener to those who wish to automate their information and documentation services.

Francis Inganji
Lutz Hüttemann

"PADIS" TRAINING PROGRAMME: OBJECTIVIES AND COVERAGE

by PADIS
(presented by F.K. Inganji)

Introduction

The PADIS training programme aims at developing and co-ordinating a network of facilities capable of meeting the national requirements of Africa for technically competent information and documentation personnel who would collect, process, store and disseminate development information required for economic and social development planning.

PADIS has been created by ECA to facilitate development information exchange among ECA member States, and this training programme is to ensure that the region has a supply of trained personnel in PADIS/DEVSIS methodologies to facilitate participation of the African countries in PADIS, through:

a) Producing an increased number of trained documentation personnel.
b) Improving and maintaining the quality of documentation and information personnel already in service.

These aims are to be achieved by providing support to the documentation centres with a view to:

a) Improving their efficiency.
b) Developing their training courses along more practical lines.
c) Ensuring that they become self-supporting.

Main objectives of the PADIS Training Programme

The main objectives of this training programme are to continue and expand the operational activities in respect of:

a) The support of all information and documentation institutions of a regional, subregional or national nature through the provision of fellowships for training of trainers, and the recruitment of short-term consultants and the co-operative development of teaching programmes particularly by strengthening co-operation among the various training centres. Meeting of heads of training centres both inside and outside the region will be convened by PADIS for discussions on programme organization, development of curricula, the need for specialized courses etc.

b) The provision of assistance to countries in establishing middle level training programmes. Such assistance may take the form of help in formulating projects and in obtaining lecturers or in providing course materials.

c) The provision of assistance in the quest for financial resources, especially in respect of student fellowships, teaching staff, training of trainers and expansion of facilities etc.

d) The appropriate dissemination of information on information and documentation training activities including surveys of activities of centres participating in the PADIS system, which cover information on number of students curricula review, financing and any associated problems.

e) The provision of any other co-ordinating services which help in implementing the PADIS system.

Type of Training

The type of training given under this Programme is dependent on the needs of each country, institution or a group of countries or institutions. Requests for specific training programmes are dealt with on individuals basis. However, PADIS offers the following Courses and Seminars which we feel help to meet best specific needs:

(1) Short full-time courses, with duration from one week to four weeks, to provide intensive preparation for e.g. how to index using PADIS/DEVSIS methodologies or for a specialized group e.g. computer programmers.

(2) Technique or problem-oriented workshops of several days to 4 weeks duration to develop very specific competencies or skills in some aspects of documentation centre management, systems development etc.

(3) Assignment of PADIS staff on a temporary basis to national documentation Centres to assist in In-Service Training Programmes.

(4) Senior level Seminars for top administrators of documentation centres to update them on PADIS/DEVSIS methodologies, administration etc.

(5) Training courses of 7 days to 14 days in length for groups of information and documentation personnel to orient them to new ideas, approaches in regard to processing development information in line with PADIS/DEVSIS standards.

(6) Short Seminars to provide a forum for persons with common professional interests, enabling them to exchange experiences, secure new concepts, learn of significant achievements with new methods and to promote higher standards of professional conduct.

Content

PADIS Training Programme normally cover the following broad areas of study:

(1) PADIS Methodologies
(2) Data Processing Techniques
(3) Data Base Management
(4) Interactive Information Systems
(5) Regional Co-operation in Information Work
(6) Microfliming and Reprography

(7) How to participate in PADIS without computerisation in the first instance

(8) Computerized Documentation

(9) User needs and PADIS System etc.

Each of the mentioned areas of study represents a field of central importance in which significant developments are taking place and in which PADIS is active. Detailed programmes of studies based on the identified areas of study will be designed to take account of the needs and backgrounds of those selected for participation in the activities of PADIS Training Programme.

How to participate in PADIS Training Programmes

In most cases, training planned by PADIS is announced and letters are sent to member States asking for nominations to such training programmes. A standard application form has been prepared by PADIS which is normally completed by prospective candidates. Once PADIS receives the nominations from various countries, selection is carried out and successful candidates are notified.

Secondly, member States or individual institutions wishing to participate in PADIS activities make special requests to PADIS to have their staff members trained. In such cases, if funds are available, training is provided to such institutions either in Central Co-ordination Office or in member States themselves.

TRAINING OF INFORMATION PERSONNEL
THE CONTRIBUTIONS OF "DSE"

by L. Hüttemann

Introduction

The German Foundation for International Development (DSE) is an institution under civil law headed by a Board of Trustees composed of reprensentatives of the government and public. Through six specialized centres (Education, Science and Documentation Centre, Bonn; Economic and Social Development Centre, Berlin; Area Orientation Centre, Bad Honnef; Public Administration Promotion Centre, Berlin; Industrial Occupations Promotion Centre, Mannheim; Food and Agriculture Development Centre, Feldafing) DSE performs the following tasks:

- dialogue and exchange of experience on development issues
- advanced training of specialists from developing countries in the various fields of DSE's specialization
- information and documentation on development issues to the German public
- development and compilation of teaching materials
- preparation of German specialists for overseas assignments.

The Information and Documentation Training Programme is executed through the Education, Science and Documentation Centre. On an average 5 to 7 short term training measures ranging from 3 days to 6 weeks are realized per year, and 15 - 20 scholarships for long term training measures ranging from 3 month to 2 years are granted.

Background

The development aid policy of the Federal Republic of Germany favours measures serving the fight against absolute poverty and

satisfying, at first hand, the primary needs of men, one of which is Education[1]. Education cannot be acquired without a functioning infrastructure in the field of information and documentation. Hence, assistance towards the establishment and extension of information structures in developing countries is a substantial contribution to the realization of satisfying the primary need Education.

The Major Programme VII of UNESCO deals with the production of methods for the processing of information, the interconnection of information systems, the improvement of information infrastructures, and the reduction of obstacles regarding the general availability of knowledge[2]. Corresponding to the UNESCO objectives DSE through the I&D Training Programme tries to contribute to the promotion of

- establishment and extension of information data banks
- the creation of compatible and interconnected information systems
- the improvement of bibliographical, archival and documentary services
- the conduction of training courses for information specialists and users

mainly in Africa, thereby considering conventional methods of data acquisition, retrieval and transmission as well a modern technologies.

A reliable I&D system contributes substantially to the stabilization of the economic and social development in Third World countries. Lack of trained manpower is one major obstacle in the development of information services in developing countries, and very acutely to Eastern and Southern Africa[3]. The measures of DSE's I&D Training Programme aim at an improvement of the information infrastructure in the mentioned region, including the promotion of regional and international cooperation, thereby interlocking long and short term measures as much as possible. As the most prominent partner organizations to achieve the objectives feature UNESCO, IFLA, ESAMI and PADIS.

The amazingly fast development of I&D in industrialized countries, speeded up by the employment of the so-called New Media, leads to an increased need of specialists in this field in the developing countries, too. There is an enormous danger to be cut off of the international information flow either at medium or long range. At present the few existing I&D centres of the Eastern and Southern African region cannot be supplied with enough trained manpower. In addition, the library training institutions within this region do not offer formal courses in I&D, not even as part of the existing training courses in librarianship. The supply in formal education is deficient, too: in Lesotho, Swaziland, and Seychelles no courses for library assistants are offered; other countries lack courses for librarians[4].

A related problem is the improvement and perfection of appropriate or adapted teaching and learning material for the region[5]. There is a vast open field for the development of adequate curricula. Planners will have to consider that today it may be sufficient to back up education and training on conventional techniques and methods, but the above described progress of the New Media will definitely question such traditional training programmes.

The developing countries of the region strive at the establishment and strengthening of I&D centres within the framework of national information policies, basing the efforts on discussions inspired by UNESCO during the late 60's and 70's. There are attempts to extend existing educational institutions to "Regional Schools", respectively to expand the range of formal training courses by a post-graduate course in information science at two universities of the region[6].

The establishment of ECA-PADIS was a first step towards international cooperation, followed by consultations on the creation of SADIS for the SADCC group in 1981/82[7]. These own efforts are to be supported through accompanying aid programmes. The region's countries cooperate in the field of I&D, apart from UN organizations, mainly with IDRC, ABC, SIDA, NORAD, DSE and the British Council[8]. The Eastern and Southern African Management Institute (ESAMI) functions as DSE's most prominent partner to realize the

I&D Training Programme. Regional training courses are carried out since the mid-70's.

The exact demand for training programmes in the field of I&D cannot be estimated from already published documents. Speaking in terms of quality there is no doubt that there is a need to carry out education and training courses in this field, and that the demand for such courses will rather increase in the future. Missing or inadequatly used coordination bodies require DSE's intensified action for training measures, which should also have a complementary character to the region's efforts as well as to other donor institution's efforts[9].

The I&D Training Programme strongly encourages an interconnection between long and short term measures: either former scholarship holders are enabled to get some sort of refresher training, or seminar or workshop participants are enabled to attend formal I&D training courses. DSE will also promote the development of genuine teaching and learning material; the same applies to the exchange of experiences on professional and technological innovations.

To date there is no coherent research evidence on education and training demands for all countries of the region. This is not an endeavour DSE can undertake - maybe ECA-PADIS would be the appropriate institution. But more precise information on such demands has been collected recently through the "Information Experts Meeting" held in Harare in March 1985, and consequently the I&D Training Programme has been structured in line with the conclusions drawn in this meeting.[10]

DSE's contributions in general terms

It should be noted that DSE's contributions towards meeting the demand for education and advanced training of information personnel in the Eastern and Southern African sub-region can only be of modest nature. Since 1985, most of the programmes offered by DSE are realized within packages which are titled:

1) Advanced Training of Personnel from Information and Documentation Establishments of the Sub-Region;
2) Support of Establishment and Improvement of National and Regional Information and Documentation Services;
3) Long Vacation Programme "Introduction to Librarianship and Documentation".

The remaining programmes are organized on an ad-hoc basis to satisfy specific demands. Some of them are devoted to assist in the development of teaching and learning materials for use at library training institutions in the sub-region, others to support nationally organized activities with regard to manpower training of information personnel. Such programmes are summarized under:

4) Additional Programmes

With regard to long term training DSE provides scholarships for information and documentation courses:

5) Formal education programmes at recognized institutions in the field of librarianship, archives and documentation through Government Scholarships administered by DSE.

At present DSE cooperates with the University of Botswana, Dept. of Library Studies (Certificate and Diploma Courses), the Indian National Science Documentation Centre (Advanced Training Courses in Information Science), the National Archives of India (Diploma Courses in Archival Studies) for anglophone countries from the region, and the Ecole de Bibliothécaire, Archivistes et Documentalistes (Diploma Courses in Librarianship, Archives and Documentation) for francophone countries from whole Africa. The number of scholarships may be increased slightly if cooperation agreements with other educational institutions can be established.

Another service of DSE is the publication of documents related to the I&D Training Programme. However, DSE may not fund or cosponsor any projects of any sort. This applies also to research projects.

University programmes leading to advanced degrees (M.A., Ph.D.) are not within DSE's competence and are administered by the Deutscher Akademischer Austauschdienst (DAAD) based in Bonn.

Implementation of the Information and Documentation Training Programmes

DSE's activities within the 1986-88 period will be developed mainly within the "programme packages" mentioned earlier in this paper. The following paragraphs describe in more detail the contents of the packages.

1) Advanced Training of Personnel from Information and Documenation Establishment of the Sub-Region

A series of programmes for information personnel of three different levels (sub-, semi- and professional) intend to contribute to the improvement of information provision of literature and facts needed for the development of the countries in the sub-region. The programme contents consider the use of computers in information handling and modern management methods/organizational techniques as well as basic professional requirements, in order to achieve user-friendly information and documentation services. Some programmes are designed to meet the needs of specific economic sectors, like agriculture, trade or health services, and others to satisfy the demands for advanced professional training in more general aspects. The publication of the programme reports (containing lectures and recommendations) is considered to be a supporting measure of the overall package. The reports serve as teaching and learning material in the countries of the sub-region and enhance the international exchange of experience in this field. The major partners are ESAMI (Arusha/Tanzania) and PADIS (Addis Ababa/Ethiopia) plus various national institutions. DSE also co-operates with international organizations like Unesco, FAO, ITC, WHO, and others, if the theme of

the programme requires such specific input. Examples of programmes are:

- Management of Information Services[11)]
- Use of Computers in Information Handling
- Fundamentals of Library and Documentation Work
- Agricultural Information Services

The programmes for semi-professional and professional levels are open to nominations from all countries of the region; those for sub-professional level are implemented on a national scale.

2) Support of Establishment and Improvement of National Information and Documentation Services

Since 1984, a chain of workshops at national level on Establishment, Coordination and Improvement of National and Regional Information and Documentation Services is being realized in the countries of the SADCC region. The programmes aim to improve the planning and decision making capabilities in national authorities concerned with development measures and to increase the efficiency of existing information systems and services. All workshops support the efforts made in this respect by the countries themselves. Each single programme links national activities with the development and expansion of regional information systems. It is supposed that the whole series of workshops improves the general access to knowledge, reduces shortcomings in the supply of literature and facts needed for the socio-economic and cultural development and avoids duplication of efforts with regard to bibliographic control in the countries of the region. Partners are mainly national institutions like library services and professional associations, but also PADIS and ESAMI. Each year one workshop is convened:

1984: Malawi 1985: Zimbabwe
1986: Swaziland and Lesotho 1987: Botswana
1988: Zambia, plus evaluation of the series.

Participants at the national level are selected by the national partner institutions; one observer from each of the neighbouring countries is admitted. Resource persons are drawn from the whole sub-region.

3) Long Vacation Programme "Introduction to Librarianship and Documentation"

After a pilot course in 1984, it has been decided to support a series of programmes with the above title, held annually at the Department of Library Studies of the University of Botswana, with formally untrained library and documentation personnel from the sub-region as the target group. Such vacation courses serve two purposes: one is to improve the professional capabilities of staff in information and archival establishments, the other is to exploit previously unused capacities of the existing training institutions during vacation periods. The course contents concentrate on supplying basic professional skills in library and documentation work. It is hoped that such programmes ease the demand for manpower training courses, and that spill-over effects take place through the development and subsequent publication of the teaching modules, which will be made available to all library training institutions in anglophone African countries. DSE's partner is the University of Botswana, with which an agreement for three years 1985-87 has been signed. After an evaluation during the last programme in 1987, it will be decided whether to continue with the series or to develop yet another long vacation programme for a different target group. All countries of the region may nominate participants; announcements for the annual programme can be obtained from the Head of Library Studies at the University of Botswana around January each year.

4) Additional Programmes

Apart from the programmes contained in the three packages described above, DSE cooperates in or convenes specialized courses, seminars and conferences within the field of information and docu-

mentation training, if time and funds permit, upon requests. These contributions range from a) facilitating the participation of professionals in an international conference over b) the provision of external resource persons from the sub-region or Germany for nationally organized programmes to c) cofunding or complete sponsoring or courses and seminars. Some examples of c) are:

- Information Experts Meeting
- Archival Planning/Management (with ICA)
- Education for Librarianship on the Grassroot Level (with IFLA)
- Development of Teaching Material for Library Education[12)]
- Harmonization of Trianing programmes (with Unesco, IFLA, FID, ICA).

Experts for nationally organized programmes and conference travel funding may be requested worldwide, but support of parts or complete programmes may be requested only from the countries of the Eastern and Southern African sub-region.

Concluding Remarks

It should be mentioned that the contents of all sponsored programmes are always developed jointly by partner institution(s) and DSE, and not just imposed. This cooperation gives evidence of the partner-oriented approach applied at DSE. Therefore, there is confidence that every single programme within the current planning and implementation period 1985 to 1988 will achieve the desired results, and provide incentives to other national institutions in the Eastern and Southern African sub-region to develop and implement similar training courses. DSE will revise the programme structure from 1989 onwards, if the current state of art in information and documentation training in Africa changes considerably during the next few years.

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INTRODUCTION TO "PADIS-DEV"

by PADIS
(presented by B. Teshager)

I. The PADIS system, concept and design

The PADIS system is being conceived as a network oriented towards the user, and therefore implies defining the universe of anticipated users and their possible information needs. This universe is defined as the group of authorities, professionals, researchers and technicians who take part in the different stages of the development process and who in carrying out their activities require different types and qualities of information.

The system is designed to be as flexible as possible taking into consideration the various needs and development priorities of the region. It includes the constitution of (a) a bibliographic reference service, (b) a descriptive inventory service and (c) a numerical data bank. The structure of the PADIS system will include eight components: DEV, COM, PROM, CORE, STAT, TEND, NET/STISD and ADMIN.

PADIS-DEV - socio economic development information component

PADIS-COM - complementary bibliographic reference data base

PADIS-PROM - project management data base concerning research and development projects

PADIS-CORE - common register data base concerning African specialists and institutions

PADIS-STAT - statistical data bank concerning chronological data on Africa

PADIS-TEND - technical numerical non-statistical data bank on natural resources, industrial facilities, industrial products, commodities, etc.

PADIS-NET/STISD - scientific and technical information system for development

PADIS-ADMIN - PADIS integrated system for administrative information including software packages for personnel, finance, stock-keeping and general services management systems

Of these the PADIS-DEV, COM, STAT and CORE are operational with varying degree of development status.

PADIS has designed the following two components in order to deal with bibliographic information:

i) PADIS-DEV, the socio-economic development information component is a bibliographic reference data base system implemented by PADIS that concerns all aspects of published and unpublished literature on the development of Africa. The documents cited in the PADIS-DEV data base will be made available in microcopied form, i.e. in standard microfiches, reproducing the original documents page by page. These microfiches are physically stored in a master file, copies of which will be distributed to the African cooperating centres and the PADIS National Information and Documentation Centres (NIDC).
ii) PADIS-COM, a set of complementary bibliographic reference data bases concerning Africa, prepared in collaboration with regional institutions (ADB, IDEP, etc.), subregional institutions, national documentation centres, international organizations (FAO, ILO, WHO, etc.), as well as with the assistance of ECA Substantive Divisions and concerning scientific, technological and economic documentation.

The difference existing in the two PADIS bibliographic components (DEV, COM) is due to the different origin of the information, to the

various responsibility levels in which PADIS is involved for the information input and to the physical location where the data bases involved are stored.

The PADIS Central Co-ordination Office (PADIS/CCO) will be responsible only for the information contained in the PADIS-DEV component file.

As far as the set of the PADIS-COM files are concerned, they are, or will be produced by specialized competent organizations following international (PADIS compatible) standards, and stored in the PADIS system.

As an example of PADIS-COM complementary files, one can mention the UNIDO and ILO data bases as international co-operative information systems components.

II. Underlying principles of PADIS

In brief, PADIS is based on the following principles:

i) Member States should be assisted in the sharing of literature and basic data which they produce on questions relating to social, economic, scientific and technological policy making, including the management, transfer and assessment of science and technology and their application to development.

ii) It is based on voluntary participation of Member States and international or national organizations as regards information input. The output of the system should be made available to all Member States and to participating organizations.

iii) It is conceived as both numerical and non-numerical data systems.

iv) It should integrate existing and future computerized "on-line" information retrieval services into a commonly shared network on a cooperative basis.

v) It should initiate advances in information technology in areas of common interest, such as promoting multilingual projects and encouraging standardization.

The above assigns to PADIS the role (in Africa) in the field of scientific, social and economic information which may be defined as that of promoting interaction between:

a) National institutions for research study, planning, development coordination, etc. which are generators and users of information;
b) National information units which control, process and disseminate information;
c) Regional and international information networks and systems, by sector, by discipline or by mission, and;
d) Information users, persons and institutions.

III. Scope of PADIS-DEV

PADIS-DEV is a mission oriented system and therefore information should be admitted to the system if it was generated with the purpose of contributing to the accomplishment of the mission. The following set of definitions have been elaborated to reinforce the concept of purpose and participating centres are advised to look for this when making their decisions whether or not a given piece of information should be included to the system.

A. FACTS, TRENDS AND ANALYSES

A.10 Basic information and data: national and regional

Statements of factual information and data relating to existing economic and social conditions and phenomena (including resources, production, consumption, distribution, trade and other transactions) for the African region, sub-regions and for particular countries.

A.20 Extrapolations and forecasts: national and regional

Extrapolations of economic and social conditions and phenomena (including resources, production, consumption, distribution, trade and other transactions) carried out with the purpose of forecasting future situations for the African region, sub-region, or for particular countries.

A.30 Existing situations: national and regional

Descriptions and analyses of existing economic, social, political and legislative situations carried out with the purpose of identifying causes of underdevelopment and factors favouring development in the African region, sub-regions, or particular countries.

B. PRESCRIPTIONS FOR DECISION-MAKING

B.10 Prescriptions for development policy or action: national and regional

Statements and studies produced with the purpose of recommendating new policies and programmes to foster economic and social development in Africa, its sub-regions or in particular countries.

C. OFFICIAL POLICIES, PLANS, PROGRAMMES AND ARRANGEMENTS

C.10 Official statements of development policy

Documents issued by or on behalf of organizations: international, regional, national and local, such as governments, banks, funding and investment agencies and political parties, defining or explaining their policies in relation to the pursuit of development goals. Overall general descriptions by such organizations of their present and future activities.

C.20 Commentaries on official policies and activities

Commentaries on the policies and overall activities of organizations: international, regional, national and local, such as governments, banks, funding and investment agencies and political parties.

C.30 Development plans

Official plans, papers on plans and statements issued by organizations: international, regional, national and local such as governments, banks, funding and investment agencies and political parties, detailing their development plans, programmes, resource allocations, budgets, etc.

C.40 Commentaries on development plans

Commentaries on the official plans issued by organizations: international, regional, national and local.

C.50 Legal, financial and administrative arrangements: international and regional

Official documents relating to co-ordination and co-operation in development activities, establishing or involving international or regional institutions, or linking parties in different countries: treaties, agreements, institutional and contractual arrangements.

C.60 Commentaries on international arrangements: legal, financial and administrative

Commentaries on international arrangements relating to co-ordination and co-operation in development activities: legal, financial and administrative aspects.

C.70 Legal, financial and administrative arrangements: national

Official documents relating to co-ordination and co-operation in development activities, establishing or involving national or local institutions within single countries.

C.80 Commentaries on national arrangements: legal, financial and administrative

Commentaries on national and local arrangements relating to co-ordination and co-operation in development activities.

D. DEVELOPMENT ACTION: OPERATION EXPERIENCE

D.10 Studies for particular projects

Studies (including feasibility studies and market surveys) related to the economic and social aspects of specific projects and the evaluation and appraisal of proposals and projects.

D.20 Development resources (particular projects)

Studies identifying resources for a specific development project and methods used in raising the resources.

D.30 Announcements and descriptions of new projects

News releases, announcements and descriptions of development projects that have been approved and are to be undertaken.

D.40 Operational experience (particular projects)

Description and progress reports of particular development projects: reviews and evaluatory reports of the experience itself, including managerial, financial, legislative, administrative and contractual aspects: co-ordination and control experiences.

D.50 Operational experiences (general)

General review and evaluatory papers on experiences in implementing development projects and programmes, including managerial, financial, legislative and administrative aspects; co-ordination and control experiences. Retrospective reviews, such as annual reports, of the activities of organizations involved in development actions.

E. CONSEQUENCES AND EVALUATION

E.10 Impact

Analytical studies and interpretations, commentaries, reviews and evaluations of the economic and social impact of development policies, plans, programmes and projects.

E.20 Evaluations

Evaluatory reports of specific development strategies, programmes and projects on the basis of the results achieved.

F. RESOURCES AND TOOLS FOR DEVELOPMENT

F.10 Research policy and surveys of research capacities and research personnel for development purposes

Descriptions of policies, programmes and activities (including annual reports) of development research institutes. Directories of research institutes and personnel. Bibliographies of research publications.

F.30 Information

Descriptions and surveys of information systems and services designed to support development activities. Directories of such systems and services. Glossaries and other terminological aids.

F.30 Men, money and materials

Descriptions and surveys of the resources available for development actions: international, regional and national. Directories of such resources.

F.40 Models, methodologies, techniques and tools

Descriptive and evaluative accounts of techniques and tools (e.g. economic and social indicators, econometric models, methodologies and computer programmes) useful in economic and social forecasting, development policy-making and planning, project appraisal, project management and programme evaluation.

G. SCIENTIFIC, TECHNOLOGICAL AND OTHER INFORMATION RELATING TO DEVELOPMENT ACTIVITIES

G.10 Scientific, technological and other information generated in the African continent and relating to any area of social and economic development which has not been entered into an international data base or international indexing and abstracting service.

G.20 Scientific and technological information which is considered important within the framework of the transfer of technology among developing countries.

The PADIS worksheet

The PADIS worksheet and manual are currently used by PADIS/CCO for the preparation of the DEV file and have been officially distributed to all the ECA Member Countries. It is divided into three main parts, corresponding to the main steps involved in the creation of a bibliographic record.

The first part identifies the record, the input centre and the type of documentary unit under consideration. The second part contains all the information considered indispensable for describing the documentary unit being analyzed. The third part is used to describe the content of the unit by means of standard alphanumeric codes, standardized indexing terms or descriptors, and free language abstracts.

A manual for document analysis has been prepared by PADIS/CCO, including field definition, tag number, mnemonic code, format and examples of all the fields necessary to describe the secondary form of documents to be stored into the PADIS System.

In order to allow maximum possibility of exchange of information among the various systems PADIS defined the following compatibility levels:

a) Field compatibility, i.e. the existence of the same common field as used to enter the secondary form information (e.g. author name, title, abstract, etc.) for document analysis;

b) Morphological compatibility, i.e. the application of the same international rules to enter appropriate information into the fields used for document analysis;
c) Terminological compatibility, i.e. the use of the same vocabulary taken from standardized hierarchially-arranged lists (thesauri), to enter by co-ordinated indexing the description of contents of the documents to be analyzed.

IV. Document Analysis Procedures

Each document selected for storage in the PADIS System undergoes a series of procedures that lead to the creation of a bibliographic record which contains the information required for its retrieval. The documentary unit that is to be analyzed and described in the PADIS worksheet will be referred to as documentary unit. The information contained in all the analytical fields of the PADIS input worksheet, together with its format, represent what we shall call the record associated with the documentary unit being analyzed. There are 3 steps involved in completing the input worksheet

1) The first step is the identification of the record, the input centre, and the type of documentary unit under consideration;
2) The second step is the cataloguing or recording of all the information considered indispensable for describing the documentary unit;
3) The 3rd part or 3rd step is the content analysis:
   i) The first procedure of content analysis is carried out by describing the content of the documentary unit by means of standard alphanumeric codes.
   ii) The 2nd procedure of content analysis involves the use of standardized indexing terms called descriptors taken from the Macrothesaurus. PADIS is using the OECD Macrothesaurus which also has a French version. The Macrothesaurus is divided into 4 parts which provide as many different approaches to the relationship between descriptors and synonyms in alphabetical order. Each descriptor is accompanied

by its equivalents in two basic languages - French and Spanish. It is followed when necessary by a top term (TT), and references to the synonymous - User For (UF), generic (BT) or broader term, specific (NT) or narrower term, and associated (RT) related term descriptors with which it is related. The 3rd part of the Macrothesaurus arranges the descriptors according to their hierarchical relationship. The 4th part is a permuted descriptiors index which supplements the alphabetical classification.

iii) The 3rd procedure of the Content Analysis is the abstracting or summarizing of the content of the documentary unit in free text or free language. This should be written without added interpretation or criticism. The abstract should be kept simple and should not be longer than 800 characters which is about 10 type written lines.

Most important and foremost the indexer must always familiarize himself thoroughly with the document he is analyzing. By browsing and quick-reading through, he can do this without reading the document word by word but by picking up the important points.

Finally, all the information on the worksheet is entered or input into the system through the computer terminals. The bibliographic record will support the on-line retrieval and display system and meets the requirements for the publication of various products, e.g. catalogues, bibliographies, and indexes such as the DEVINDEX-AFRICA.

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0 0 8 5 0 0 2 3 7

PADIS

Document (A/M/C)

PERSONAL AUTHOR AND AFFILIATION A010	
CORPORATE AUTHOR A011	
DOCUMENT TITLE A101	Confederation of Zimbabwe Industries, Harare,/ZW
TRANSLATION ENGLISH A042	
TRANSLATION FRENCH A043	Role of locally incorporated manufacturing enterprises in implementing the programme for the Industrial, Development Decade for Africa: Zimbabwe's basic manufacturing industries.
TRANSLATION A044	
TRANSLATION OTHER A045	

Source (M/C)

PERSONAL AUTHOR SOURCE A030	
CORPORATE AUTHOR SOURCE A031	
TITLE SOURCE A130	

Sou.(S)

TITLE SERIAL A910	
VOL/PART A970	ISBN A138

	En	

		ECA
		Addis Ababa ET
		6 Dec. 1985 1985-12-06
		27 p.
		ECA/JID/IuDA/WP.1

CONFERENCE		African regional workshop of experts on the role of private business and parastatal in the accelerated implementation of Industrial Development Decade for Africa.
		Addis Ababa ET 11-13 Dec. 1985

Codes

		XAO										
	A30											

Descriptors

/Manufacturing*1, (industrial development*/

/development strategy/, /industrial sectors/, /metallurgy/, /fertilizers/, /pesticides/, /pulp and paper industry/, /plastics/, Coal/, /electrical equipment /, /hand tools/, /Zimbabwe/

Abstracts

E

Presents the industrial performance of Zimbabwe 1979-1981 and the integration of the manufacturing sectors with the restoof the economy and the interlinkages within the manufacturing, sectors and between the rest of the economy; describes the status and role of the metallurgical, engineering, metal products, machinery and equipment, electrical machinery, appliances, transport equipments, chemical and petrochemicals, fertilizers and pesticides, dyes, paints and pigments, plastics, pulp and paper, general chemicals and coal.

F

A

COST OF LIVING
COUT DE LA VIE / COSTO DE LA VIDA - 11.05.10
THE ACTUAL COST OF GOODS AND SERVICES ACCEPTED AS NECESSARY FOR LIFE IN GENERAL. DO NOT CONFUSE WITH STANDARD OF LIVING.
- *BT:* HOUSING EXPENDITURES
- LIVING CONDITIONS
- PRICE INDEXES
- PURCHASING POWER
- RENT

COST-BENEFIT ANALYSIS
ANALYSE COUT-AVANTAGE / ANALISIS COSTO-BENEFICIO - 11.05.10
- *BT:* COST ANALYSIS
- COSTS
- DECISION MAKING
- ECONOMIC EVALUATION
- EDUCATIONAL COSTS
- EDUCATIONAL OUTPUT
- PROGRAMME EVALUATION
- PROGRAMME PLANNING
- PROJECT EVALUATION

COSTA RICA
COSTA RICA / COSTA RICA - 11.05.10
- *TT:* AMERICAS
- *BT:* CENTRAL AMERICA
- *BT:* COSTA RICANS

COSTA RICANS
COSTA-RICIENS / COSTARRICENSES - 14.05.10
- *BT:* COSTA RICA

- *BT:* INDUSTRIAL GROUPS
- OILSEEDS
- SOFT FIBRES
- TEXTILE FIBRES
- *BT:* COTTON INDUSTRY

COTTON INDUSTRY
INDUSTRIE COTONNIERE / INDUSTRIA ALGODONERA - 11.05.10
- *TT:* INDUSTRIAL SECTOR
- INDUSTRY
- *BT:* TEXTILE INDUSTRY
- *BT:* COTTON

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE / CONSEJO DE EUROPA - 11.05.10
- *TT:* INTERNATIONAL ORGANIZATIONS
- *BT:* EUROPEAN ORGANIZATIONS
- *BT:* EUROPE
- WESTERN EUROPE

COUNTERPART
CONTREPARTIE / CONTRAPARTE - 11.05.10
- *BT:* COUNTERPART FUNDS
- COUNTERPART PERSONNEL

COUNTERPART FUNDS
FONDS DE CONTREPARTIE / FONDOS DE CONTRAPARTE - 11.05.10
CONTRIBUTIONS IN LOCAL CURRENCY TO PROJECT COSTS BY COUNTRIES RECEIVING DEVELOPMENT AID.
- *BT:* COUNTERPART
- DEVELOPMENT PROJECTS
- TECHNICAL COOPERATION

- *TT:* JUDICIAL SYSTEM
- *BT:* JUDICIAL SYSTEM
- *NT:* CONSTITUTIONAL COURTS
- LABOUR COURTS

COWPEAS
NIEBE / CAUPIES - 07.05.10
- *TT:* CROPS
- FOOD
- PLANTS
- *BT:* GRAIN LEGUMES

COWS
VACHES / VACAS - 11.05.10
- *TT:* ANIMALS
- *BT:* BOVIDAE
- DAIRY CATTLE

CRAFTSMEN
ARTISANS / ARTESANOS - 14.05.10
- *TT:* OCCUPATIONS
- *BT:* OCCUPATIONS
- *NT:* MASTER CRAFTSMEN
- *BT:* HANDICRAFTS

CREATIVITY
CREATIVITE / CREATIVIDAD - 11.05.10
- *BT:* ART
- ARTISTIC CREATION
- DESIGN

CREDIT
CREDIT / CREDITO - 11.05.10
- *NT:* AGRICULTURAL CREDIT
- COMMERCIAL CREDIT
- CONSUMER CREDIT
- INDUSTRIAL CREDIT

... in revenue, even if income tax and duty on import of raw materials for the industry were exempted for 10 years. *Industrial potential*, metal products*, planing*, feasibility studies, industrial processes, production costs, raw materials, import volume, industrial investments, statistical tables, Benin.*
MF: 00-80-00114

XA2 CI 0299 Meyer, K.R. ECA/FAO Forest Industries Advisory Group for Africa, Addis Ababa, ET. Proposed development plan for an export pulp industry in the Ivory Coast. Addis Ababa, ET, ECA, Jul 1973. 30+14p. tables. IND-24.
☐ Studies the prospects for developing an export pulp industry in Ivory Coast. Outlines the main features of a proposed development plan, including a summary of alternatives for a raw material base and an estimate of timing and costs. Recommends measures for implementing the plan. *Industrial potential*, pulp and paper industry*, industrial projects*, development plans, raw materials, industrialization, forest utilization, industrial investments, costs, pre-investment surveys, forest production, export-oriented industry, statistical tables, recommendation, Ivory Coast.*
MF: 00-80-00211

XA2 CM 0300 Maclennan, W.J. Carlowitz, P. von ECA/FAO Forest Industries Advisory Group for Africa, Addis Ababa, ET. Potential of forest industries development in Ghana. Addis Ababa, ET, ECA, Dec 1974. 32+12p. tables. IND-59. MR/54.
☐ Investigates the development potential of the forest industry in Ghana; surveys the following forest industrial subsectors: sawmilling, plywood manufacturing, furniture production, paper converting and printing. Proposes measures for further development of the industry in the country. *Industrial potential*, forestry industry*, wood products*, feasibility studies, location factors, marketing boards, export volume, training centres, production, consumption, raw materials, employment creation, industrial promotion, furniture industry, plywood, recommendation, statistical tables, Ghana.*
MF: 00-80-00202

XA3 ET 0302 ECA, Addis Ababa, ET. Interim preliminary report on the industrial utilization of the low-land bamboo of Wollega Province. 1973. 8+1p. IND-4.
☐ Explores the possible utilization of bamboo resources in Wollega Province, Ethiopia, for the manufacture of dissolving pulp and in the furniture and building industries. Suggests preliminary project ideas and outlines actions for promoting the use of bamboo. *Industrial potential*, grasses*, construction materials*, furniture industry, industrialization, industrial projects, industrial promotion, recommendation, Ethiopia.*
MF: 00-80-00259

XA3 KE 0303 Hillstrom, R. ECA/FAO Forest Industries Advisory Group for Africa, Addis Ababa, ET. Survey of paper converting and printing industries in Kenya. Addis Ababa, ET, ECA, Jun 1974. 20+22p. tables. IND-40.
☐ Examines the paper converting and printing industries in Kenya in terms of raw material requirements, the employment situation and training requirements, export position and potentials, and the importance of the industry. Recommends steps for improvement and expansion of the industry. *Industrial potential*, pulp and paper industry*, printing industry*, industrial production, industrial promotion, raw materials, marketing, foreign trade, woodworking industry, industrial statistics, statistical tables, recommendation, Kenya.*
MF: 00-80-00257

XA3 SO 0304 Ubart, E. ECA/FAO Forest Industries Advisory Group for Africa, Addis Ababa, ET. Charcoal problem in Somalia. Addis Ababa, ET, ECA, Feb 1976. 21+1p. tables. IND-111/MR-99.
☐ Discusses problems in charcoal production and availability of raw materials in Somalia. Suggests measures for improving production. *Industrial potential*, coal*, wood products*, raw materials, production, consumption, industrial processes, forest production, fuels, forest resources, statistical tables, recommendation, Somalia.*
MF: 00-80-00208

TOP: Sample page of OECD Macrothesaurus
BOTTOM: Sample page of DEVINDEX

BACKGROUND PAPER FOR INFOTERRA BRIEFING

by Wo Yen Lee

Introduction

INFOTERRA is an environmental information system designed to facilitate the flow of environmental information within and between countries and was established in response to recommendation 101 of the Action Plan for the Human Environment adopted by the United Nations Conference on the Human Environment (Stockholm, June 1972) "... to organize an International Referral Service for sources of environmental information ...", and the subsequent relevant decisions of the UNEP Governing Council regarding its further development. They effectively constitute the INFOTERRA mandate.

INFOTERRA concept was developed during 1973-1976 and the system became fully operational in January 1977 with the participation of a dozen countries. At present, 126 countries have designated national focal points, (which cover over 98 % of the world population). Over 5,400 sources are listed in the INFOTERRA Directory, and a cumulative total of over 42,000 queries has been processed for users in 114 countries.

INFOTERRA was designed as a decentralized system, based on and operating through government-designated national focal points. This decentralized structure was thought to be the least costly means of facilitating information exchange, as well as the most effective in catalysing the upgrading of national information systems by Governments, or their creation where none existed.

The fundamental aspects of INFOTERRA have been defined as decentralization, provision of information to decision-makers through the source registered in the INFOTERRA Directory (national or international), facilitation of exchange of environmental information through the access of environmental databases, promotion of aware-

ness of the role and importance of information in environmental decision-making, and the stimulation of development of national environmental information systems. An independent evaluation carried out in 1980 (by UNESCO) concluded "it can be said that the original mandate has been fulfilled in terms of the existence of the structure which was required to be created." However, as a result of the evaluation, this mandate was revised by the UNEP Governing Council in 1981 to include the provision of services beyond referral, especially the provision of substantive information direct by the NFPs.

An INFOTERRA Advisory Committee (IAC) was established in 1983 composed partly of NFPs and partly of information specialists. Each meeting of the IAC reviewes every aspect of INFOTERRA activities and makes recommendatations which are then implemented by the Programme Activity Centre (PAC).

The information system

The INFOTERRA information system consists of five components: national focal points, sources of information, Special Sectoral Sources, Regional Service Centres and the INFOTERRA Programme Activity Centre.

(i) National focal points

The INFOTERRA national focal points are the key elements in the network, as they provide the input for the Directory and are the first point of contact with the users. Some of them, especially in developed countries, consider the informal and relatively easy dialogue and access to national environmental information systems resulting from the network of INFOTERRA national focal points to be one of the greatest benefits they derive from their participation in INFOTERRA. Yet, in practice, some focal points have proved to be a major limiting factor to INFOTERRA activity in that, by design, INFOTERRA depends very heavily on the goodwill of its focal point staff, who often have full-time responsibility in other spheres and for whom virtually every action

(registration of sources, processing queries, promotion of the system, etc.) results in extra work for an already fully occupied staff member.

(ii) Sources of information

The community of sources listed in the International Directory may be considered as the main product of INFOTERRA and form the backbone of the INFOTERRA database. Judging from the feedback obtained from the users, the sources do in many cases provide useful information; there are, however, great variations in the quality of sources. INFOTERRA provides little if any incentive to sources in the majority of cases, and it is therefore our great concern to ensure that the information provided is carefully researched, selected and evaluated as one has the right to expect.

The five-volume Directory of sources is somewhat unwieldy and difficult to use without a computer, which very few national focal points have. For this reason, the PAC offers to focal points an automatic telex search facility. Queries are often too broad, and therefore searches yield more sources than any user could possibly care to review, let alone to contact. This requires interaction between the users and focal points with resulting delays.

(iii) Special Sectoral Sources

These are centres of excellence (sectoral sources) in selected environmental priority sectors. They are world renowned organizations which can provide comprehensive, authoritative information in their own sectors. These organizations are contracted by UNEP to provide substantive information, at a nominal charge, to users selected by the PAC. The selection of queries to receive this additional help is based on the nature and the origin of the query with priority being given to users from Governments of developing countries - policy makers, scientists, engineers, etc.

(iv) Regional Service Centres

Given the similarity in environmental problems in a region or sub-region, regional centres for environmental information have been appointed as regional service centres. This permits services such as computer search facilities, training, promotion, the provision of substantive information, etc. to be provided more economically or in a more professional manner.

(v) Programme Activity Centre

The PAC was set up as an internal project of UNEP to co-ordinate the network. Its major tasks, in line with the catalytic and co-ordinating role of UNEP, have been to assist Governments in establishing and developing INFOTERRA national focal points, providing the necessary training to national focal staff, especially in developing countries, assisting with directory searches and developing model publicity materials. The co-ordination was accomplished through designing standardized operational procedures and terminology, and by publishing the INFOTERRA International Directory. Given the decentralized structure of the INFOTERRA network, however, INFOTERRA operations in individual participating countries depend almost entirely on the efforts of their national focal points and the Government support they receive.

The INFOTERRA Systems Tools

INFOTERRA was conceived as a system of maximum simplicity. It was designed to give valid results with the minimum of professional information system expertise. The principal tool of INFOTERRA is the International Directory of sources. This has undergone a number of format changes, and many attempts have been made to reduce the volume of a very substantial publication. Some changes were made in the 1985 issue due to input format changes, and the index was improved considerably.

Another tool used by the System is the terminology. The entire vocabulary has now been revised and restructured. INFOTERRA operational procedures have undergone continual improvement since the start of operations. The introduction of the revised terminology and input procedures will, however, necessitate certain additional changes. A completely new operations manual is scheduled for publication soon.

Provision of on-line information search services

INFOTERRA has been engaged in on-line information search services to provide "delayed on-line search" for selected INFOTERRA users. Users would forward their requests through the national focal point to the PAC in the usual manner for specialised services, and the PAC would then select the more important queries and request on-line services by telex. The results would then be returned direct to the user by appropriate means, e.g. mail, telex, etc. depending on costs and urgency. In this way, users from anywhere in the world have gained access to all existing major environmental databases through INFOTERRA.

When the necessary computer and communications facilities become available in Nairobi, comparison of cost-effectiveness between direct on-line searches from Nairobi and delayed on-line searches carried out in Europe or North America will permit a decision as to the feasibility of initiating the former from UNEP headquarters. At this time it will also be advisable to undertake a feasibility study of the possibility of maintaining copies of some more frequently used data bases on the the Nairobi computer.

THE POPULATION INFORMATION NETWORK FOR AFRICA

by POPIN-Africa
(presented by P.G. Amonoo)

I. Background and History

Inaugurated in January 1984, POPIN-Africa is a decentralized regional network comprising institutions and organizations connected with, and/or dealing with population information generation, collection, documentation and dissemination in and on Africa. In response to mandates from various ECA Conferences of Ministers, specifically Resolution No. 400 (XV) of 1981 which requested the ECA Secretariat to intensify the Commission's activities in the field of population information, documentation and dissemination, POPIN-Africa has been established to pruvide a vehicle through which African policy-makers, planners, researchers, etc. can be assisted with population information resources to enable them better integrate population variables into their socio-economic policy formulation and implementation. It also constitutes a concrete mechanism for the realization of some of the major guidelines provided in the Kilimanjaro Programme of Action on Population (KPA) regarding the provision and dissemination of population information for the African Region (KPA recommendatinns 78-81).

POPIN-Africa is cast within a global effurt aimed at "furthering the exchange among countries of information and policy experiences in the field of population and consumption" as recommended in the World Population Plan of Action (WPPA) of 1974. Thus, jointly with other regional networks and systems based at the other UN regional commissions and elsewhere, it collaborates in this overall effort to improve the flow of population information throughout the world. It is the African regional component of the global Population Information Network (POPIN) based at the UN Headquarters in New York. Its other regional counterparts are DOCPAL (Sistema de Documentacion sobre Poblacion en America Latina) of ECLAC in Santiago, Chile; the

Asia Pacific/POPIN of ESCAP in Bangkok; as well as systems such as POPLINE of the USA (comprising POPINFORM, Population Index, and Columbia University) to mention a few. Its database also constitutes a sectoral complementary file on population for the Pan African Documentation Information System (PADIS) forming part of the PADIS-COM file.

The latest of these networks to be established, POPIN-Africa still has a lot to do to operationalize the concerns and needs which prompted its establishment. Its objectives, structure as well as projected outputs and services have been formulated based on these perceived needs and resources of the African Region.

II. Objectives

The objectives of POPIN-Africa may be summarized as follows:

- To assist in the formulation of sound population policies and programmes by providing access to population information;
- To provide and establish better ways of improving the flow of population information among institutions and organizations dealing with population information and related activities in Africa;
- To develop common norms and standards to ensure compatible systems and services for population information flow in ECA member States;
- To assist in developing appropriate population information infrastructure in ECA member States through advisory services including the training of librarians and documentalists for the collection, processing and dissemination of population information;
- To develop mechanisms for the continuous monitoring and evaluation of population information and documentation activities in Africa to ensure the effectiveness of the network;
- To establish a POPIN-Africa 'referral file' on population projects, statistics, research findings and bibliographies;

- To collaborate with members of the International Population Information Network (POPIN) in order to strengthen the operations of POPIN-Africa and to participate in a global effort to improve the flow of population information, world wide.

III. Network structure

As a decentralized network, POPIN-Africa comprises, as of now, sub-regional, sectoral and national participating centres and institutions as well as a Coordinating unit based at the Population Division of the ECA. Following decisions taken at the Second POPIN-Africa Consultative Meeting in 1983 and also at the first session of the POPIN-Africa Advisory Committee in 1985, the following regional demographic training and research institutes constitute the sub-regional and sectoral participating centres: the Cairo Demographic Centre (CDC); the Centre of African Family Studies (CAFS); the Institute de Formation et Recherche Démographiques (IFORD); the Regional Institute for Population Studies (RIPS); and the Sahel Institute (RESADOC). The selection of these institutes to serve as sub-regional centres was dictated by the need to maximise on existing resources in the region - since they are centres of excellence already involved in the research and generation of population information and documents, as well as the training of future policy-makers, etc. they were deemed fertile nodes to utilize for the emerging POPIN-Africa. Additionally, while at the national level there is little activity in the area of population information and documentation, these centres on the other hand, already had reasonably decent document collections to support their own teaching and research activities. They could thus, with few additional inputs, be strengthened to serve as catalysts for activities at the national level. National centres and institutions are currently being identified and will be strengthened to serve as national participating centres (NPCs).

Annex I provides an organogram indicating the different levels and linkages of the network while pages 4-7 of POPIN-Africa Briefs, No.

1&2 detail out the specific functions of the components of the network.

IV. POPIN-Africa methodologies for information processing, storage and retrieval

The Coordinating Unit is currently engaged in preparing a technical manual to provide guidelines to POPIN-Africa participating centres, on data entry, vocabulary compatibility, etc. We shall discuss briefly here the major details of these aspects of our processing, storage, etc.

(i) Processing and storage

With technical backstopping from PADIS, POPIN-Africa has already created the referral file for the network. At present, there are only some 400 items/records which have been entered and these constitute documents coming largely from the Coordinating Unit. The sub-regional, sectoral and national participating centres are expected to make inputs into this database which will eventually merge all pertinent information from the Region. The main tool used for input is the new POPIN-Africa bibliographic worksheet. Based largely on the PADIS worksheet, the POPIN-Africa worksheet is a modified version which takes into account some of the major requirement of the population field. The changes were introduced following the POPIN-Africa Technical Review Meeting held in December 1984 in Addis Ababa, where the additions were approved. Some of the new additions include data fields such as B320, B330, B340 and B350. We believe that these new fields are not only highly pertinent to the population field but may even be desirable additions to the present PADIS worksheet.

There are plans to hold training sessions for POPIN-Africa participants to be briefed properly about the use of the worksheet for bibliographic description and content analysis. UNISIST guidelines for bibliographic description as contained in the

UNISIST Reference Manual for machine-readable bibliographic description are the standard used.

(ii) Document content analysis

For the purpose of indexing its documents, POPIN-Africa uses the Population Multilingual Thesaurus (PMT) of the global POPIN. The PMT is now closely matched to the OECD Macrothesaurus thus making it more compatible to other established controlled terminologies in use. The PMT is published in English, French and Spanish versions - an Arabic version is currently being prepared under contract with the Arab League Documentation Centre (ALDOC) in Tunis.

As a matter of interest, the Coordinating Unit is also using the PMT subject categorization for its subject classification of the collection of its Reference Unit.

V. Population information requirements and key user groups

Before delving into the type of services and outputs envisaged under POPIN-Africa, it will be important to place in appropriate perspective the basic requirements of the population field and thus of its user groups. In other words, who are the eventual users of the network and what are their major requirements regarding population information? Without a clearer understanding of the characteristics of the population field it becomes difficult to project services and outputs which may not actually satisfy user needs.

The population field is recognized as an interdisciplinary one which relies very heavily on disciplines in the social sciences, biological and medical sciences, and to some extent, the physical sciences. The interrelationships of the population question with moral and ethical issues hinge on the humanities. Since the field relates very closely with all aspects of human living, this creates serious problems for the information specialist. The population field while tapping on many other disciplines still remains a highly specialized area requiring

specialized documentation techniques, etc. if the fullest use is to be made of the resources available to it.

The "public" which this special field serves is therefore a mixed one involving professional demographers, statisticians, human geographers, medical doctors and paramedical staff (involved in family planning delivery services), researchers, teachers, I.E.C. specialists, policy-makers and planners, and the general public. For all these groups, population information requirements are different and discrete and the information scientist/documentalist/ librarian has to be very much aware of these different requirements in order to ably and usefully serve them. These needs may require us to stock, for example, long runs of census data, statistical data, worksheets, tabulations, and manuals, enumeration maps, research and evaluation reports, documents on family planning acceptor characteristics and continuation rates, family life education, etc. We may need also, in response to these needs, to establish schemes to identify and collect fugitive documents which constitute a major source of information for this field. Care has to be taken however, lest in attempting to cover all subjects of concern to potential users we end up developing a database of unmanageable volume and scope. The problem of knowing where to draw the line remains a very real one.

In the African region, there are added problems connected with the identification and availability of the necessary documents. Information accessibility and therefore of its transfer and subsequent use is a major bottleneck in our countries where the qualitative benefits of information are not immediately obvious.

The above considerations have considerably guided the type of outputs and services of POPIN-Africa.

VI. Outputs and services

Conscious of the wide ranging nature of the population field and of its user groups as well as the near impossibility of any one unit to

comprehensively collect and disseminate all available population information, resource sharing, capitalizing on the strengths of the components of the network has been one of the principles guiding POPIN-Africa's design of outputs and services.

Among the major outputs and services of POPIN-Africa are the following:

(i) Publications

(a) African Population Newsletter - which consists of articles on population trends, population policy, fertility morality, etc. It serves as a status report on population-related activities in the region. It additionally carries brief notes and reports of interest to POPIN-Africa members.

(b) POPINDEX-Africa - a bibliographic index containing information on population-related documents. It contains informative abstracts (in both English and French) as well as geographic, subject and author indexes. A conference list as well as a publishers' list are also provided to assist users in tracking down sources of information, where needed. Two issues have already been published. Inputs for the index are from all participating centres.

(c) Special country bibliographies - the first in this series is being compiled on Kenya by the Kenya National Library Service (KNLS) for 1986. Another one is expected to be issued on the population of the Sahelian countries in 1987 and we expect the Sahel Institute to undertake this assignment. This exercise will assist in assessing national population information resources.

(d) Sourcebook - material is being collated to produce a reference tool containing pertinent information on population issues for the African Region.

(ii) Document back-up delivery services - this service includes the provision on request of photocopies and microcopies of all materials cited in POPINDEX-Africa. Since a large section of the user group may not have direct access to some of the documents

cited in the Index, the delivery of such back-up service ensures that needed information can reach interested users. Additionally, the Coordinating Unit has instituted a programme called POPIN-Africa Duplicates Programme (POPAF-Dups) whereby duplicate materials from both the Coordinating Unit and other components of the network are collated and distributed, on request, to African institutions, researchers, etc. who may require same for their work. The response has been very encouraging.

(iii) Training - depending on identified needs for the training and upgrading of skills among its network members, POPIN-Africa has programmed a series of training seminar/workshops. Initially, this training will be aimed at the documentalists in charge of the sub-regional participating centres who in turn will be expected to serve as trainers for national participating centres. Training guides and manuals covering POPIN-Africa methodologies for input, etc. are presently under preparation for the first of these seminars to be held in October 1986. Wherever possible, network members will be encouraged to participate in PADIS related seminars and workshops so as to enable them also to learn about PADIS methodologies for input, etc.

Internship and familiarization schemes have also been planned to enable network members to learn of each other's experiences in population information and documentation and thus help upgrade documentation and other related skills. Advisory services in the form of technical backstopping will be provided to interested centres and institutions to strengthen population information and documentation services at all levels of the network.

(iv) Referral file services - the merged files of POPIN-Africa will be available for access by all interested persons in the Region. Depending on the availability of the relevant technology, etc. computer tapes (for those centres with computer hardware, etc.) as well as printouts, will be generated for distribution to interested users in the Region. Other files will be generated to satisfy other identified needs as these arise.

(v) User promotion and sensitization - In order to bring about a wider awareness and hence, greater utilization of population information for planning purposes, it is planned to actively promote and sensitize users by utilizing some of the dissemination vehicles of the press and the mass media in Africa. Agencies like the Pan African News Agency (PANA) have already expressed interest in publishing from time to time, on behalf on POPIN-Africa, news bulletins highlighting major population issues of concern to the Region. Similar arrangements are to be finalized with the Associated Press Service (APS) to further disseminate population information using their nodes within the Region.

It is further planned to organize user sensitization seminars and workshops for planners, etc. to coincide with major professional meetings in the field.

VII. Conclusion

In the preceding paragraphs we have tried to trace the background and history, objectives, and operational structures of the Population Information Network. We have also indicated the type of user groups and the services and outputs expected of POPIN-Africa to serve these interests. POPIN-Africa, along with PADIS, is a big challenge to this Region in the way and manner in which it can successfully harness existing population information resources to provide our user groups with their information requirements within reasonable costs in order to promote effective planning, programming and implementation.

We wish to end this presentation with a quote from UNESCO "... a country's development depends on its application of knowledge and information rather than in the generation of new knowledge. The knowledge and information are readily available somewhere in the world; they must however be made accessible to all kinds of decision-makers, to entrepreneurs and scientists, engineers and tech-

nologists, and means for communication and transfer must be established. In fact, in many countries, it is the gap in information accessibility and transfer, and therefore of use, which must be bridged if economic progress is to be made ...". This is the overall goal of POPIN-Africa and it is our hope that jointly with PADIS and other systems and networks with complementary missions, we shall attain the final goal.

POPIN-AFRICA

NAME OF FILE A 100		ANALYTIC	MONOGRAPHIC	COLLECTIVE	MONOGRAPH	SERIAL	COLLECTION	SERIAL/ PERIODICAL	MONOGRAPH	NON-CONVENTIONAL	LEGISLATION	THESES	CONFERENCES	STATUS OF RECORD A 150			
ACCESSION NO. A 110														N	C	O	
PHYSICAL LOCATION/ LIBRARY CODE A 120																	
PARTICIPATING CENTRE																	
NAME B150	CODE B160	A 131			A 132			A M V L T C									
								TYPE OF DOCUMENT A 170									

DOCUMENT (A/M/C)	PERSONAL AUTHOR AND AFFILIATION A 210	
	CORPORATE AUTHOR A 220	
	DOCUMENT TITLE A 230	
	TRANSLATED TITLE (ENGLISH) A 240	
	TRANSLATED TITLE (FRENCH) A 250	
	TRANSLATED TITLE (ARABIC) A 260	
SOURCE (M/C/S)	PERSONAL AUTHOR-SOURCE A 310	
	CORPORATE AUTHOR - SOURCE A 320	
	TITLE SOURCE A 330	
	SERIAL TITLE A 410	
	VOL. NO. A 420	ISSN A 430

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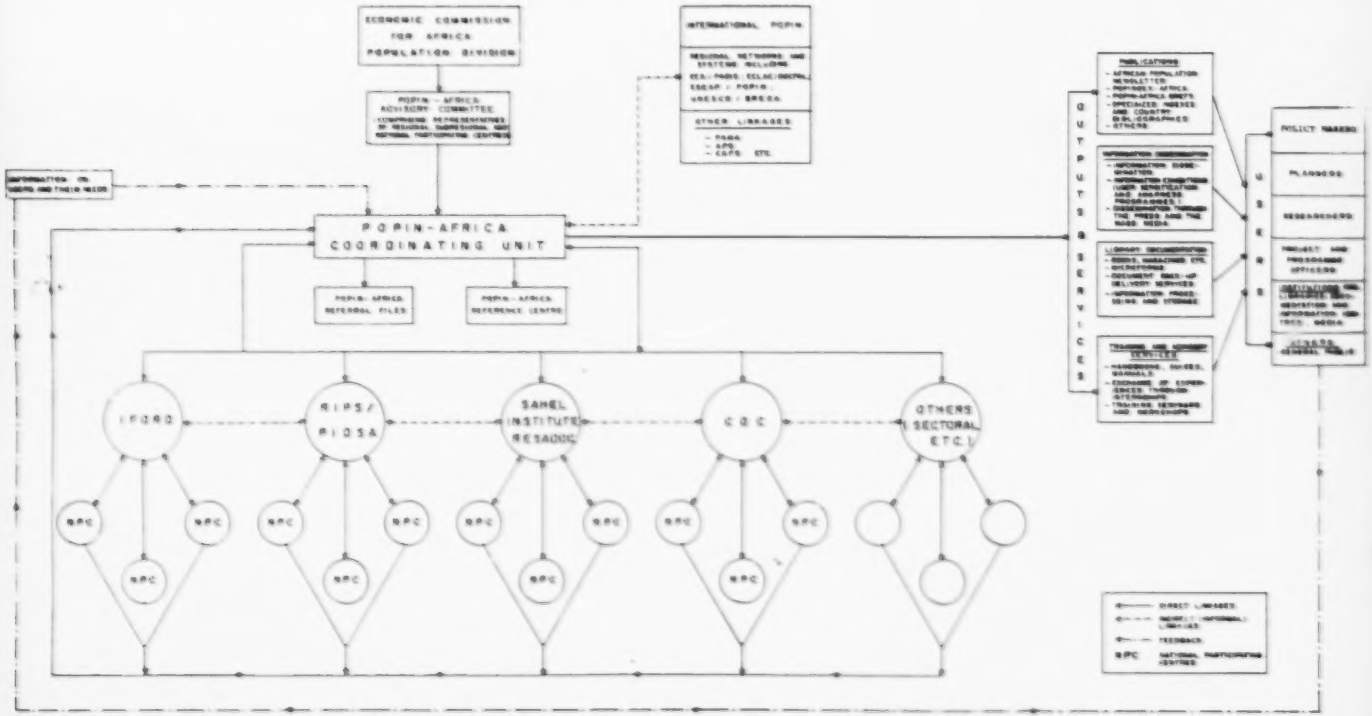
POPIN-AFRICA INPUT SHEET 1985

OPERATIONAL STRUCTURE OF THE POPULATION INFORMATION NETWORK FOR AFRICA (POPIN-AFRICA)



"MINISIS": AN INTEGRATED SET OF INFORMATION SYSTEMS FOR INFORMATION RETRIEVAL AND LIBRARY MANAGEMENT

by PADIS
(presented by K.T. Mavuba)

Introduction

Minisis is a generalized information management system designed to run on the Hewlett-Packard 300 series mini-computers. It is an integrated set of information systems:

First, it does not deal only with bibliographic information, but it takes care of all the functions of a library such as collecting, cataloging, loans and so forth.

The second level of integration deals with the possibility to organize the work of documentation which is common to many institutions. Today there are many institutions using a common vocabulary to describe documents. To improve the exchange between documentation centres, it was indispensable to standardise the description of documents.

The third level of integration deals with the subject by itself. Minisis is flexible enough for many types of applications. The entities which are not of bibliographic type such as maps, photos, films, statistics are well described within Minisis.

Historical Development of Minisis

Minisis was developed by IDRC (a public corporation created by the Canadian Parliament in 1970) as part of its research programme in information sciences. From the beginning IDRC has been concerned with techniques for the computerized processing, storage and retrieval of bibliographic information both to provide service to the

centre's own staff and to build the competence to advise interested institutions in the developing countries.

In the beginning IDRC was operating Integrated Set of Information System (ISIS) on a service-bureau computer. ISIS which proved expensive was a package developed by the International Labour Office in Geneva. Since 1976 IDRC has developed a low cost mini-computer-based package that can be used for its own inhouse needs and can also be made available to other institutions and would be flexible enough for use by Government or industry, to meet the needs for a low-cost hardware, software package permitting on-line data entry and interactive retrieval. The name MINISIS came from ISIS. Minisis performs essentially the same functions as ISIS, but does not require a large mainframe computer.

Technical Tools and Services of Minisis

The efficiency of a computerized documentation system depends closely on how the files are structured and the fundamental software used by the computer. Concerning the Minisis software the data are contained in three kinds of files:

1) The Master file which contains the real bibliographic data. The records have variable length and are stored sequentially. So it is necessary to know where is the beginning of each record in the magnetic support such as disk;
2) The Cross reference file which contains the addresses of the beginning of each record and the sequence number of the record permits quick location of a record in the master file;
3) The Inverted file is used to create a fast access path: It contains a list of descriptors: each descriptor is followed by all the sequence numbers of records in which it appears.

Data contained in Minisis databases can be seen in 3 different points of view:

- An internal point of view, which is the view of end-users (such as searcher, librarian, indexor);
- A conceptual point of view, which is the view of the database manager;
- An internal point of view which is the view of the operating system.

End-user

The End-user's requirements are divided into two categories: data entry and data retrieval. Seven major application processors (an application routine that implement a particular function) have been implemented.

For data entry, the end user has:

1) The INPUT processor. That processor permits the end-user to enter new records into the system. Depending on the structure of the data to be introduced, an internal sequence number (ISN) may or may not be required for that record. If one is required then it will be generated automatically by the data base management routines. If bibliographic levels are necessary for the user view, prompting will be done accordingly. The input processor offers many possibilities:
   - Automatic checking for duplicate records;
   - Validation of the content of data fields against standard authorities.

2) The MODIFY processor permits the user to make changes to records within the system. The modifications operate on fields and can be any one of:
   - CHANGE: to change data within a field
   - ADD: to add a new field
   - DELETE: to delete a field
   - TRANSFER: to transfer one field to another
   - REPLACE: to replace an old field with a new one.

This processor can work on record level or on a set of records (global level). Normally the user access the record by its ISN. If the user does not have the ISN then he may do a search within the processor to find the record in question.

3) The RELEASE/DELETE processor permits the user with appropriate security clearance within the system to release records and to delete records. The deletion of records is logically rather than physical.

   A record may be released in either of two ways: The first release flags the record as being one to which changes can no longer be made. This feature is particularly useful; it signifies that the record is clean and its prevents modification from being made in error. The record type of release will undo the first release, i.e. it will free the record for further modifications.

For data retrieval there are:

4) The QUERY processor, which enables the user to search databases interactively or in batch using boolean operators or doing free-text retrieval. The full data base can be scanned or a portion of it; and a search depending on the user's view of the data base. Query provides a multilingual thesaurus retrieval. This thesaurus relates descriptors to one another through the concepts of broader term, narrower term, related term, any term, and so on. A search using the structural relations in the thesaurus (BT, Training) will result in a search being done on training and its broader terms, in all available languages. Other features include brousing and root search capabilities.

5) The INDEX processor enables a user to generate outputs in any sequence that may be desired. Index works on the output of a query or on a user view to produce sort keys that will be used to produce ordered outputs from the inputs.

6) The COMPUTE processor enables a user to perform arithmetic operations on data and to produce reports based on the results of arithmetic operations.

7) PRINT: This processor does all the printing for the system from the outputs of Index, Query, Compute or any user view defined for the data base. The processor is very flexible: printing can be done on special forms or plain paper: it can be tabulated or columnated with page numbers and so forth.

System Manager

It has a number of processors for maintenance and extention of the data base:

1) ISONCOV: This processor produces and accepts tapes in ISO-2709 format. It is made as general as possible, with facilities for special processing exits so that data bases from as many organizations as possible could be exchanged;

2) DATADEF: This data definition processor is used to create, modify and delete all forms of data definition (views);

3) RENUMBER: It permits the replacement of ISN's with other ISN's. It is used in the production of printed bibliographies;

4) INVERT: It does batch inversions on fields to provide new and faster access paths to a data base;

5) GARBAGE: It is run periodically; it recovers unused and free spaces within the data-bases and generates backups of the physical files of which the data base is comprised.

Internal view

At this level we find procedures that are the implementation of the relational theory. They include those listed above, in addition to three others functions:

- processing generated keys;
- doing actual work involved in releasing and deleting records;
- organizing data definition for producing the user view for the application programme and the system view for the data base management system.

Conclusion

The MINISIS has mainly been designed for bibliographical information systems but a lot of other applications can be designed with MINISIS:

- it has complete compatibility with ISIS;
- MINISIS contains a group of programmes which can be used for library management and documentary retrieval in libraries;
- the outputs of MINISIS can be microfiches (COM);
- MINISIS can produce magnetic tapes following the ISO 2709 norm so data can be exchanged between centers, on magnetic tapes.

HOW TO PARTICIPATE IN "PADIS" WITHOUT COMPUTERISATION IN THE FIRST INSTANCE

by PADIS
(presented by F.K. Inganji)

The Pan-African Documentation and Information System (PADIS) has been created under the aegis of the United Nations Economic Commission for Africa (ECA). It is presently handling development related numerical (statistical) and non-numerical (bibliographic) information. It is anticipated that with the emergence of various mission and discipline-oriented systems, PADIS will be multidisciplinary in scope and will establish effective linkages with international information networks and data bases situated outside Africa, thus enabling it to serve a large part of the total information needs of the African continent. PADIS is designed to serve the African countries by providing ready access to information required by policy makers, technicians, planners and others engaged in the economic and social development of African States. For PADIS to be successful in this important task, it requires the cooperation of all the African countries. Such co-operation should be in the form of full participation in PADIS activities, for example by providing information input.

Some countries in Africa have got fears of participating in PADIS activities, most of these fears stem from a misconceived fact that without hardware and software configurations installed in each country, no participation in PADIS activities can take place. This paper will therefore try to outline some steps to be considered by individual countries to enable them participate in PADIS activities e.g. the production of DEVINDEX-AFRICA, the collection of development related documents etc.

Application technologies in information handling in Africa, is still undeveloped. Many information and documentation centres in Africa still use manually operated systems in information retrieval, processing and dissemination. However, with the increase in the volume

of information acquired by many documentation centres, it is becoming increasingly desirable for computer technology to be applied, (reasons known to most of the participants). However, before PADIS becomes an interactive information system, and before many African countries become self-sufficient in information technology activities, a method is being suggested to member States within which many national centres and institutions in Africa can participate in PADIS activities.

Of immediate concern to the African countries in relation to development information is to know what exists in the form of information on each country and to have staff working in documentation centres trained. To participate in PADIS without computerisation in the first instance, the following steps are suggested:

(1) Countries to designate a documentation centre as national PADIS participating centre. Or individual sub-regional or regional institutions engaged in development information may get in touch with PADIS and make official applications to become PADIS institutional participating centre.
(2) Request to be made from PADIS or any other organisation for training of staff in PADIS methodologies.
(3) Training to be given to other national centres staff on how to complete the PADIS input-sheets.
(4) Compilation of documents at the national level.
(5) Requests for funding from various donors for printing of DEVINDEX.
(6) Send the compiled information to PADIS for preparation of tape and publication.

Alternatively, the input sheets once completed can be verified by a PADIS staff and a DEVINDEX printed within the country itself. Such information should be sent to PADIS/CCO for inclusion in a DEVINDEX Africa for the benefit of other countries. If you have not started to get involved in PADIS activities, please start now, to make PADIS an effective Information System for Africa.

SUMMARY OF PRESENTATIONS BY PARTICIPANTS

During the course of the workshop, two sessions were devoted to presentations by participants. Participants had been requested to prepare short notes on the status of information and documentation services in their countries. Participants had been requested to comment on the following:

(a) Coordination of Information Services within each country;
(b) National information policies;
(c) National documentation centres;
(d) Manpower development in the information and documentation sector.

Coordination of Information Services

Most participants stated that no central coordination of libraries and documenation centres existed in their countries. However, they stated that some form of inter-library loan systems existed, though in most cases on informal friendly basis.

National Information Policies

Of the participants who made presentations to this workshop, none stated the existence of a national information policy. On this issue many participants sought the assistance of PADIS in drawing up national information policies.

National Documentation Centres

The participants to this workshop stated that the very fact that countries do not have national information policies makes it difficult for them to designate national documentation centres. However, some

countries, like Botswana, have centres presently carrying out the roles of national documentation centres, though on a limited scale.

In so far as PADIS national participating centres are concerned, most participants stated that this has not been done due to the lack of knowledge regarding the criteria used by PADIS to have a national participating centre designated. Of all the countries represented at this workshop, PADIS has an official participating centre in only one, though PADIS is in contact with various centres in this sub-region.

Manpower Development in the Information and Documentation Sector

The problem of lack of qualified personnel to handle the type of information technology on the market was cited a stumbling block to the development of information and documentation infrastructure in many countries of the sub-region. Most participants suggested that, in order for many countries to participate in PADIS activities, alot more training in general documentation techniques and PADIS methodologies is needed. There was also concern about the curricula of the library training schools of the sub-region which do not include aspects of computerized information and documentation work but concentrate on traditional librarianship.

BIBLIOGRAPHIC INFORMATION MANAGEMENT USING MICROCOMPUTERS: THE EXPERIENCE OF "ICRAF"

By Richard Labelle

ICRAF : the institutional context

The International Council for Research in Agroforestry (ICRAF) promotes agroforestry, a term applied to all land use systems in which trees are deliberately combined with crops and/or animals Lundgren & Raintree (1983). Agroforestry has the potential for stabilizing and ameliorating agricultural production and for helping farmers and land managers in developing countries to become self sufficient. The Council is the acknowledged international centre of excellence in agroforestry.

In order to fulfill its mandate, the Council identifies,acquires,analyses and disseminates information and publishes research results on agroforestry. Within ICRAF, it is the Information and Documentation programme, known as Info/Doc, which is responsible for doing this.

Info/Doc is a specialized information analysis centre which provides a variety of information products and services. Info/Doc attempts to serve the information needs of a specified user community made up of researchers, development planners and others working or interested in agroforestry in developing countries. Priority in the provision of services is given to individuals or institutions working on field-related development/research projects in these countries.

Over the past four years, Info/Doc has directly answered over 400 separate queries for information on agroforestry.

Documentation.

The documentation activity provides a variety of services and products to the Council's target audience. At present, this activity includes a question and answer service, which involves locating and acquiring documents to meet user demands, including designing outside literature searches and corresponding with various literature services worldwide, evaluating documents received and undertaking subject analysis and input of bibliographic records to the computerized library catalogue, consulting with ICRAF's multidisciplinary team of specialists on specific questions posed by users and , finally, corresponding with these users. As part of this work, several abstract journals and external data bases are screened monthly for relevant literature . This screening is directly responsible for nearly all reprint acquisitions and results in over 100 titles received every month, mostly in reply to reprint request cards that are mailed to authors.

Other services include the preparation of specialized bibliographies, the annotation of bibliographies and the referral of users to other ICRAF specialized data bases to answer requests. Starting in 1986, (selective dissemination of information) (SDI) literature service will be offered to selected users and more bibliographies will be researched and produced. Reviews on selected topics in agroforestry are a natural outcome of bibliographic research and will be produced in the near future.

Need for computers.

In acquiring bibliographic resources so that they could then be used to meet the current and future needs for literature on agroforestry, it became clear that an electronic data base

management system (DBMS) could be useful. Using a DBMS, each bibliographic unit or document could be described as one record in a file that could be updated as more bibliographic units were added to it. Each record would contain the normal bibliographic descriptors, i.e. author, title, publisher, keywords, etc., so that records containing specific data values for any of the descriptors could be readily retrieved.

Problems of management of a physical file or catalogue of documents would be decreased. There would be no probiproblems of losing catalogue cards or of sorting the cards, etc. Producing and sorting indexes would be facilitated. Specialized bibliographies could also be produced and even library catalogue cards.

Automation of library functions such as acquisitions, budgets, tracking book and periodical orders as well as circulation control could also be possible.

The next question concerned the computer environment that would support these tasks and wether they could be undertaken using microcomputers. In 1982 when this was being considered, microcomputers had begun to establish themselves in the marketplace.

Answers to these questions came with the realization that DBMS software existed for microcomputers that would be used to undertake these tasks, with a promise of rapidly evolving and increasingly available software and hardware innovations that would bring minicomputer sophistication and power to the microcomputer environment in the near future.

d-BASE II, a relational DBMS was tested initially and KMAN ,(Knowledge Man), a more sophisticated DBMS was acquired later.

However before considering the software, let us first examine the reasons for choosing microcomputers because these reasons may be relevant and useful to some institutions .

Selection of computer hardware: micros vs larger computers.

The choice of microcomputers over larger computer systems was based on the following considerations:

a- ease of use, microcomputers are easier to use than larger computers and user friendliness is one of the main considerations in their design.

b- cost, which is much less for microcomputers, both from the point of view of initial purchase cost and subsequent maintenance and staffing costs.

c- scale, ICRAF is a small institution, with modest administrative and scientific requirements for electronic data processing.By its nature, the Council does not undertake primary scientific research and thus has a limited need for data acquisition and statistical analysis usually undertaken on mainframe or minicomputers.

d- backlog of data, when the Council began its current programme of work in 1981, no significant backlog of data existed.

e- value of investment, the continuing and remarkable technical innovations that brought the microcomputer to individual users in the first place have established microcomputers as a business or work place productivity tool. This has created a demand that has brought down prices and which is likely to continue as more innovations are made. Micros are becoming standard office features, the micro business is booming, prices per unit of computing power are falling. There are possibly more programmers and technicians working to produce innovations for microcomputers

than there are working on larger systems. The net result of these anticipated innovations will be more powerful and user friendly systems that can meet the increasing demands for data base processing at ICRAF. All these reasons contribute to making the purchase of the more popular computers, the so called industry standards, a sound investment.

f- local service, microcomputers are serviced locally in Nairobi and there is no need to hire a service engineer to set up and operate the systems. Most microcomputers at ICRAF have been user installed and error checking is done by ICRAF technical staff, i.e. microcomputer programmers and operators. There are local sales and service representatives for the microcomputers installed by ICRAF.

The following example demonstrates that the Council is already benefiting from this choice. Innovations in hardware and software are worthy of note. From 8 bit microcomputers running at 4.77 MHz and capable of addressing 64 Kb of RAM, the Council has migrated to 16 bit microcomputers capable of addressing up to 16 Mb of RAM while running at 8 MHz or more. Faster RAM memories for micros is also becoming available.

Software innovations are showing even greater promise with the arrival of sophisticated DBMS packages and multiuser multitasking operating systems from mini and mainframe computer environments. Operating systems capable of addressing more than the current limit of 32 megabytes of mass storage imposed by PC DOS 2.0 or 3.0 while permitting multiuser and multitasking facilities are now available, i.e. UNIX/XENIX, although applications software written for these systems are not yet plentiful. Some of the advantages of these innovations will be discussed below. Understanding them is necessary in order to begin planning for DBMS implementations that are required to meet the growing needs of small to medium size data base applications, that is data bases ranging in size from a few hundred to over 64,000 records and possibly more, i.e. from less than 1 Mb to more than 64 Mb in size. This is within the anticipated range of capacities of DBMS applications envisaged at ICRAF.

In the field of publishing, innovations are impressive. Linotype machines worth tens of thousands of dollars are being replaced by microcomputers and laser printers. Typesetting and page layout can now be done using an Apple MacIntosh and Apple laser printer and associated software for under USD 12,000, CIF Nairobi.

Selection of microcomputer hardware.

ICRAF uses Wang Professional Computers for word processing and IBM Personal Computers for data base management, although both machines can and do adequately perform these tasks, along with many others.

The IBM PC was selected for the Information & Documentation Programme because it is an industry standard, it conforms to an open architecture, it is very well documented, more software exists for the IBM PC than for any any other microcomputer and a variety of high quality peripherals are available from third party manufacturers to improve the performance of the IBM product as it is. IBM is also locally represented. The IBM PC can largely be maintained in house on the basis of the technical information provided by IBM and using the Council's own computer programmer/operators.

Inexpensive peripherals, including extra memory, can be added to a PC without any need to call on usually expensive and

sometimes unreliable and ill informed local service agents. Similarly, much information in the form of independent product reviews, commentary about the computer industry and advice for programmers and system operators is available for the IBM PC's and 100% compatibles. This advice can readily be acted upon by ICRAF staff without unduly relying on or being tied to local service agents and burdened with sometimes excessive service contracts. Of course , using this information implies that there are staff motivated to do so and that they are technically competent to evaluate it.

The biggest drawback of the IBM PC is its slow clock speed of 4.77 MHz compared to 8 MHz for the Wang PC or Olivetti M24 microcomputer and the 8 bit bus. Fortunately, there are co-processors which can be added to the IBM PC expansion slots that increase the clock speed to 8 MHz and greater and convert the data path to a width of 16 bits for under USD 500 when purchased from computer mail order companies. These so called 'Turbo' cards can be added to the IBM PC without affecting the warranty of the computer and while preserving compatibility with most hardware and software, as long as the latter is not strictly dependent on the 4.77 MHz clock rate of the IBM PC 8088 CPU, in which case the speed can usually be switched back to 4.77 MHz.

Selection of DBMS software.

ICRAF uses DBMS software for several tasks, many of which are filing operations dealing with textual material and involving no mathematical manipulations. Bibliographic listings, results of surveys or questionnaires and mailing lists are some of the filing operations needed to be performed at ICRAF, and for which a microcomputer was acquired. Specifically, here are some of the tasks for which a DBMS can be considered:

- data input with error checking,
- data storage,data security and data manipulation, transformation,editing,
- selective retrieval and display of information,
- printed output in a user defined format.

KnowledgeMan or KMAN , a generalized DBMS produced by Micro Data Bases Systems, Inc. in the USA (1), is used at ICRAF for data base management. It was selected because it supports up to 255 fields and over 64,000 characters per field or per record, total. It also fulfills the tasks mentioned above.

These limits are beyond the needs of all present ICRAF applications. KMAN has the added advantage of permitting several data bases to be used at the same time , although the speed of multi file operations can be slowed down considerably when larger files are used simultaneously.

d-BASE II, a very popular commercially available DBMS was rejected because it did not support the large number of fields per record that are needed for the various ICRAF data bases.

d-BASE III, the successor to d-BASE III adapted to the 16 bit environment has not been evaluated.

A comparison of KMAN with d-BASE II is given in Table 2.

KMAN works on both the Wang and IBM PC microcomputers.

KMAN offers several features that permit a friendly user interface. In this regard, it is an improvement over b-BASE II. Several variables can be user defined to configure and set up particular environments for given tasks, including menus. Macro expansion and a high level structured language are facilities for

application development and user learning. The manual is written clearly and has been a useful learning tool for non programmers, such as the author , who can routinely undertake simple programming tasks using the KMAN command language. KMAN also has a built in spreadsheet which allows up to 255 rows (version 1.07) and can exchange data with data base records. A data base can also be treated as a spreadsheet under KMAN and analyzed as such, each field corresponding to a cell and vice versa.

Simple statistical analyses, calculations, functions and procedures for operating on numeric and string data also exist. Virtual fields and file encryption are also supported. Ad hoc enquiries, screen input/output, forms and printed forms management are also supported.

Very powerful data retrieval based on relational and Boolean logic operators can be performed using sequential searching techniques. A simple but fast indexing technique is implemented but is limited to retrieving character strings located at the beginning of indexed fields. (For more information on indexing, see below). Relational and Boolean operators cannot be efficiently used for indexed retrieval. Versatile sorting and other manipulations are also supported. Separate companion modules permit forms painting (K-Paint), text processing (K-Text), business graphics (K-Graph),mouse processing (K-Mouse) and a run time version (K-Run).(MDBS, 1985)

Human Resources.

Immaterial of what the advertisers of software packages or microcomputers have to say, user friendliness has not developed to the stage where complete novices can install themselves in front of a computer and begin to install,set up and master the system for immediate beneficial use. A learning period is be required. It is ICRAF's experience that the time and effort involved can be greatly reduced by hiring a computer programmer with at least a B.Sc. level of training in computer science. Even at this, learning is helpful in order to grasp the potential of the system and in order to tell the programmer what tasks are needed to be performed.The programmer will need this feedback in order to properly design a system. This applies especially for software packages such as KMAN or d-BASE III because application development requires high level programming in the languages appropriate to these packages.

The ICRAF Library data base.

The ICRAF library data base is an electronic form of the library catalogue. Each record in the data base is equivalent to a catalogue card. In fact, the manual library catalogue can be produced in printed format (3) from the library data base. The structure of this data base is shown in Figure 1. The library data base was structured to store information according to general bibliographic rules that Info/Doc adapted to suit its own requirements along with the main categories of information that the Council retrieves the stored information by. It is made up of 20 fields that contain the usual bibliographic categories along with subject content identifiers relevant to the interests of ICRAF. All together,the most important of these are the English and other language title fields of 200 characters in length each,

the subject and species descriptor fields each 200 characters in length and the geographic region and country code fields. The latter two are but a few characters in length owing to the use of codes to represent the ecological zones and countries.

In Figure 1, the preprogrammed form or mask used for data input and editing shows these and the other fields that together make up an individual record in the library data base. The hard copy of this mask is known as an input sheet. A printout of the command file used to define the mask and to call it up on demand is given in Appendix 1. A menu driven system for data entry and editing is also used.Figure 2 shows the name of each field and explains the meaning of each field and of each code used. Field 12 contains the two letter ISO (International Standards Organization) codes for geographical region and for countries. The codes themselves are listed in Appendix 2. Field 11 is for the ecological zone codes. These are adapted from a modified Koppen classification as described by Young (1983) and are listed in Appendix 2 after the ISO codes. Fields 15, 18 and 19 are bibliographic descriptors and are used according to Morin-Labatut and Sly (1982). Each subject and species descriptor in fields 16 and 17 are delimited with "/". The reasons for this are described below.

All together each record occupies a little over 1 kilobyte of storage space. This large space is required immaterial of wether character strings are entered into the various fields because KMAN does not support variable length fields. Most records in the data base do not need all of the space allocated to them. Variable length fields only store what is entered in them. KMAN and other popular DBMS', including both d-BASE II and d-BASE III (2), do not support variable length fields. At present, the library data base contains over 7000 records and occupies 7.7 megabytes of hard-disk storage. Of this, over 5 megabytes are used for empty parts of fields. Obviously, an improvement here would call for variable length fields or other storage conservation or data compression techniques.

Information retrieval.

One of the most important tasks a DBMS can perform is the selective retrieval of information from electronic files. Also important is the ability to output the information in a user defined format. Selective retrieval is performed using a combination of logical operators such as 'and', 'or', 'not', to link previously identified subsets of data obtained from files. There are therefore two distinct steps in selective retrieval; the creation of subsets from the data base and the linking of these subsets using logical operators sometimes known as Boolean operators.

Examples of selective retrieval under KMAN are given by the following simplified commands:

```
CONVERT FROM LIBRARY FOR (conditions)
```

CONVERT FROM LIBRARY is the command to create a separate data base that will contain all of the records from the Library data base that are TRUE for a given set of conditions.

'FOR (conditions)' causes the command to act on a given record for which the conditions are TRUE. The conditions are the sequence of relational expressions that are evaluated for each

record in the table as either TRUE or FALSE. An example of a relational expression can be all records for which the year of publication is 1978, or YEAR="1978" in KMAN language. Every record in the data base for which the year of publication is "1978" will be evaluated as TRUE and a subset of the main data base containing all records for YEAR="1978" will be created. Several other operators can be used here. They are equal to (EQ or =) as above, not equal to (NE or <>), greater than (GT or >), greater or equal to (GE or >=), less than (LT or <), lesser or equal to (LE or <=). A special operator, IN . is also used when searching for a particular character string in one or more record fields. An example would be a search of all records for those having the word 'tree ' in the English title or TITLEENG IN ["*TREE*"]. The asterisk '*' is a wildcard string match symbol that specifies that the character string 'tree' can be located anywhere in the field, either as a lone character string , or as part of a word, for example 'trees' or 'treed' or 'raintree' (a type of tree) would all result in a TRUE condition in this example.

The result of using these operators is the creation of a subset of records from the data base that are TRUE for the conditions specified, i.e. all those records that have the character string 'tree' somewhere in the English title field or those that were published in 1978.

In order to be even more specific in a search, the conditions can include the linking of subsets using the logical operators (also known as Boolean operators) AND, OR, NOT, XOR (and/or).

Combining the above two examples or subsets provides a clear illustration of this; that is searching for all records with 'tree' in the English title field and published in 1978. Each record satisfying these two conditions form another subset.

A typical query.

Under KMAN, the search criteria can be very specific. Consider the following query. An ICRAF library user seeks references in the literature to the use of Acacia trees (a genus widespread in the dry tropics) for fuelwood or charcoal in Kenya, Tanzania and Ethiopia. This researcher is interested in literature published after 1979 and written in English. A quick listing can be obtained using the SELECT command. Only a few of the fields specified are called for in the printout because a complete list would clutter up the printed output. The fields are chosen to provide the user with the most information required to decide wether he or she will consult the document itself. Using SELECT is therefore a quick way of providing the information requested for a researcher who has easy physical access to the ICRAF library.

The listing for this command is:

```
SELECT CURREC(LIBRARY), ACCESSNO, UDC, YEAR, AUTHORED, TITLEENG,
GEOGCOUN, ECOLZONE FROM LIBRARY FOR ( SPECIES IN ["*ACACIA*"] AND
SUBJDESC IN ["*FUELW*","*CHARCOAL*"] ) AND ( YEAR > "1979" AND
LANGUAGE = "EN" ) ORDER BY ASCENDING YEAR,AUTHORED
```

Brackets are used to indicate the precedence with which the operations are undertaken. Those in brackets are undertaken first. Note that, as indicated above, the output is ordered by ascending year and then alphabetically in ascending order by author.

Information retrieval with formatted output.

The CONVERT command is an intermediate step in selective retrieval when the user wants to print the output in a predefined format. Figure 4 shows a printer output formatted with the KMAN program listed in Appendix 3.This is a command equivalent to a request for those references on Acacia and fuelwood and charcoal dealing with Kenya, Tanzania or Ethiopia and published in English after 1979.

Note that CONVERT produces under KMAN/2 another data data called "FUEL.ITB"which is then printed with a user programmed command file that produces the output shown in Figure 3.

Limitations of KMAN.

Speed of retrieval.

Although KMAN allows powerful searching, it is relatively slow to identify and retrieve records meeting selective conditions, although KMAN/2 is much faster than the previous versions of the software. A simple search using the library data base, which contains over 7800 records, each a little over 1 kilobyte in size, takes about 10 minutes on the IBM PC AT before even producing formatted output at the printer.

Indexed vs sequential retrieval.

As mentioned previously, sequential searching proceeds one record at a time. It is a procedure analogous to searching for concepts or information in a book by starting from page 1 and reading to the end of the book. Each occurrence of the data sought is noted and the page(s) on which it is found is (are) kept in memory. Once the end is reached, all of the occurrences (page numbers) are listed. A data base index uses the same principle as a book index. It points to the record containing the information required or, as in the above analogy, each entry in the index lists the pages on which that entry is to be found. Like an index in a book, a data base index is a list of the searchable terms with the record number in which the term is to be found. In fact, a computerized index is another data base that is created for fast retrieval. The file created by indexing a data base is called an inverted file. Each searchable data element is listed alphabetically and the corresponding occurrences of the term, that is the record numbers, are listed alongside.

KMAN does have an index feature to speed up retrieval, but it does not support relational and logical manipulations. These operators can only be used for the sequential searching of each specified field (or fields) in each record of the data base. This is the case above with the SELECT and CONVERT commands. This limits the use of the index to predetermined key fields where the access points are located at the beginning of the field. Searching for character strings imbedded in the text of the field is not possible. This is a limitation of KMAN. As we shall see below, there are programmes that not only support these operations using indexes, but that also permit multiple access points to indexed terms that are imbedded in a field. The results are discussed below and include dramatically improved access times.

Indexed access under KMAN is nevertheless useful for quickly

obtaining all references produced by an author, as long as the author's name appears first in the field, i.e. first authors only. Thus the command to use an index in KMAN, 'PLUCK', can be used to quickly list all titles authored by "Lundgren" for example. The equivalent command using SELECT takes over 8 minutes to produce an output compared to less than five seconds to retrieve a record using an index. The other indexed fields in the library data base are the publisher (PUBLISHR) field and the accession number (ACCESSNO) field. The latter is a unique number assigned to each book and is a useful access point to an individual record.

Indexing is also used with another large data base, the mailing list. This data base contains over 4800 addresses. The index is used to retrieve records on the basis of an alphabetized field, called 'ALPHA' which contains the first 8 digits of a last name or institutional acronym. The index in this case is very useful for editing entries, although it cannot be used directly for this purpose, only to locate a record for subsequent editing. This is another drawback of KMAN.

Access points.

The KMAN indexing technique is fast, which is what an index is all about. Indexes are sometimes called pointers because they point the user to the required information. Unfortunately, under KMAN, it does not operate on imbedded text. This means it has limited access to data elements. Only the first value entered into a field can be retrieved using the KMAN index, as mentioned above.

Take for example the following string, which is a printout of the species field from a typical record in the library data base.

"ACACIA SEYAL/ACACIA SENEGAL/LEUCAENA LEUCOCEPHALA/ACACIA ALBIDA/
EUCALYPTUS CAMALDULENSIS/GMELINA ARBOREA/AZADIRACHTA INDICA/
CASSIA SIAMEA/PROSOPIS JULIFLORA/"

It is impossible to retrieve the character string ' ACACIA ALBIDA' using a KMAN index with the 'PLUCK' command. Access is limited to the leading characters of a field. The inherent advantage of an index, its speed of retrieval , cannot be used to advantage under KMAN because powerful relational and logical search capabilities are not supported with the index. The net result is that for all searches, on line methods are not permissible because they take too long for feedback to the operator sitting at the terminal. Batch processing is the only possibility. This limits user interaction and the possibility of quickly modifying search designs to either limit the number of records retrieved or to widen the breadth of the search, that is to either refine or broaden a search.

Indexed access.

Multiple access through the use of indexes that support Boolean logic operators is a very effective way of improving performance. Multiple access indexing is a technique whereby inverted files are created by marking with a delimiter (such as a /) those terms that are to be inverted or indexed (the same thing). An inverted list is a data base where each entry corresponds to a data value , usually a character string, and to which is associated a list of all occurrences of that data value in the main data base. The following excerpt from the user manual of the

'Mini Micro version of CDC/ISIS' explains this well.

' The logical relationship between the major files of a CDS/ISIS data base is best perceived by examining the way in which retrieval is performed. Retrieval from a data base is done by specifying a set of access terms which are looked up in the inverted file to locate the list of master record numbers associated with each term. These lists are then manipulated by the program according to the Boolean logic operators you have specified in your search formulation until, at the end of the search, a single list , called the hit list, is obtained corresponding to the MFNs (Master file numbers or record numbers) satisfying your specifications. If at this point you request a display of the records answering the question CDS/ISIS will retrieve from the Master file each record in the hit list, format it, and display it on the screen.' (Unesco, 1985).

It is noteworthy that the increase in speed of retrieval is not all that dependent on the hardware. Even the slow IBM PC should be able to afford rapid retrieval using indexed access.

Furthermore,as the data base grows, and assuming that the list of descriptors used is finite , then beyond a certain data base size, the same descriptors will be used over and over again. Any increase in the size of the data base will only result in more entries under already existing descriptors. The inverted list will not grow much more in size. Thus access times, which are somewhat dependent on the size of the inverted list will not increase in direct proportion to increases in the size of the main file, as it would under conditions of sequential access. Of course this is only possible with conceptually related data sets.

It is to this level of performance that Info/Doc hopes to arrive at.

Conclusion.

In conclusion, ICRAF has implemented a DBMS that satisfies many of the present needs of the Council. However, more powerful and efficient software and hardware combinations are being sought. On the hardware side, Info/Doc has acquired the IBM PC AT microcomputer which offers much improved performance over the IBM PC (it is 2.5-3 times faster) while maintaining an open architecture and offering many peripherals and competitive prices. Info/Doc also hopes to acquire Micro CDS/ISIS from Unesco in order to benefit from the advantages of a sophisticated, proven, powerful , fast and user friendly software package for the manipulation of textual data and for the eventual standardization of data base formats.

The next improvements will come with new operating systems and DBMS software that will allow multiuser and multitasking facilities so that more than one user can have access to a file at the same time and more than one operation can be undertaken at once, i.e. sorting a file while searching on a second one with the same CPU. Once this happens, the distinction between microcomputers and larger computers may disappear and powerful computer based applications will be available to development information systems.

ICRAF is also seeking to enlarge its bibliographic data base through cooperative exchanges with other information centres worldwide.

(1) Micro Data Base Systems,Inc (MDBS),
P.O.Box 248
Lafayette
Indiana 47902
USA ... are the producers of I.MAN.

(2) d-BASE III supports a variable length comments field only. Data fields are of fixed length. When enquiring with MDBS, the producers of I.MAN, about introducing variable length fields in updates of I.MAN, the reply was that these would slow down file operations.

(3) Once a suitable source of pin feed, die cut catalogue cards has been found.

Summary

The Information & Documentation programme at ICRAF operates a information analysis centre on agroforestry that integrates the activities of the documentation service, the library and publications. This paper reviews the considerations leading to the decision to acquire microcomputers within the institutional context of this programme and explains the approach taken, problems encountered and experience acquired in implementing this system. The author's views of the coming developments in microcomputer software, especially software for data base management are presented.

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Appendix 1. The printout programme to set up the input mask (LIBFORM.DEF).

```
/* form for library.itb database */
form libform1
@ 3,2 put "LOCATION" WITH "R"
@ 3,11 get location
@ 3,22 put "UDC CLASS" WITH "R"
@ 3,32 get udc
@ 3,49 put "ACCESSION NO." WITH "R"
@ 3,62 GET ACCESSNO
@ 4,2 PUT "ENGLISH TITLE" WITH "R"
@ 4,16 GET TITLEENG
@ 7,2 PUT "OTHER TITLE" WITH "R"
@ 7,14 GET TITLEOTH
@ 10,2 PUT "AUTHOR" WITH "R"
@ 10,9 GET AUTHORED
@ 11,2 PUT "AFFILIATION" WITH "R"
@ 11,15 GET AFFILIAT
@ 12,2 PUT "PUBLICATION TITLE" WITH "R"
@ 12,20 GET PUBTITLE
@ 14,2 PUT "PUBLISHER" WITH "R"
@ 14,12 GET PUBLISHR
@ 15,2 PUT "YEAR" WITH "R"
@ 15,7 GET YEAR
@ 15,12 PUT "VOLUME NO" WITH "R"
@ 15,22 GET VOLNO
@ 15,40 PUT "PAGINATION" WITH "R"
@ 15,52 GET PAGINAT
@ 15,61 PUT "NO OF REFS" WITH "R"
@ 15,74 GET NOREFS.
@ 16,2 PUT "LANGUAGE" WITH "R"
@ 16,11 GET LANGUAGE
@ 16,14 PUT "DATA TYPE" WITH "R"
@ 16,24 GET DATATYPE
@ 16,34 PUT "RECORD TYPE" WITH "R"
@ 16,46 GET RECORTYP
@ 16,50 PUT "LITERARY INDICATOR" WITH "R"
@ 16,70 GET LITINDI
@ 17,2 PUT "SPECIES" WITH "R"
@ 17,10 GET SPECIES
@ 20,2 PUT "SUBJECT DESCRIPTOR" WITH "R"
@ 20,21 GET SUBJDESC
@ 23,2 PUT "GEOGRAPHICAL COUNTRY" WITH "R"
@ 23,23 GET GEOGCOUN
@ 23,38 PUT "ECOLOGICAL ZONE" WITH "R"
@ 23,54 GET ECOLZONE
ENDFORM
```

DATA BASE MANAGEMENT

by PADIS
(presented by K.T. Mavuba)

1. What is a data base?

Traditionally, each operating group in a company such as marketing, manufacturing, engineering, had its own system, which used its own data to make decisions about its activities in the delivery of products or services. The problem with this approach is that very seldom, if ever, does all of this information agree. Marketing group sells one thing, manufacturing group makes something else, engineering group makes changes and accounting group tries to make it all balance on the books.

In this scenario, no one really knows what the facts are. The only way to develop any reliable information that portrays uniformly the facts of the business is to integrate fully all the data about the business. Full data integration requires the use of normalized data, data reduced to its lowest common denominator.

This normalized data is then stored in subject data bases that contain all the information about a given subject. Vendors for example could be a subject. The data are stored once for everyone and made available to any system or user requiring it.

A data base may be defined as a collection of interrelated data stored together without redundancy to serve multiple applications; the data are stored so that they are independent of programs which use them; and, a common and controlled approach is used in adding new data and in modifying and retrieving existing data within the data base.

- In reality, today in many data bases some measure of redundancy exists in order to give improved access time or simpler

addressing methods. Some records are duplicated to provide the capability to recover from accidental loss of data.

- Data independence implies that the data and the application programs which used them are independent so that either may be changed without changing the other.
- A data base used for many applications can have multiple interconnections between the data. In such environment the control of accuracy, privacy and security of the data is more difficult than when simple non-interconnected files are stored.

2. Basic data base terminology.

Entities such as:
- book
- document
- project
- and so on.

Each entity has several pieces of information to describe it:

Book:
- Author
- Title
- Publisher
- Abstract
- Vendor
- Order price
- ... etc.

Those small pieces of information by themselves are not of much use. They become useful only when they are associated with other pieces of information. Those pieces of information (Field, Attributes, Data element) for an entity are grouped together in a record (Tuple). Many records make up a data base. And there is a unique identifier for each record or entity.

3. Data Models.

If the function of a data base were merely to store data, its organization would be simple. But the data base must also show the associations between data items that are stored. A data base consists of data items and associations among them. A data model is a map showing how different data item types are associated.

A schema is a chart of the types of data that are used. It gives the names of entities and attributes and specifies the relations between them. The term subschema refers to an applications programmer's view of the data he uses. Many different subschemas can be derived from one schema.

The association between data items can be of two types:

a) There can be a one to one mapping from data item A to data item B. This means that at every instance in time, each value of A has one and only one value of B associated with it.
b) There can be a one to many mapping from data item A to data item B. This means that one value of A has zero, one or many values of B associate with it.

In any implementation of a data-base system, the definition of data is critical. If data are not well defined, they cannot be used. The data must have a structural definition, and their relationship to other data in the system must be understood before they can be used. This information is essential to the end users of the data base, to the data base management system itself, and to the interface between the two. We therefore have three ways of describing data in the data base (view of the data):

a) The conceptual way contains information on entities together with relations and existing conditions. It is the over-all logical data base description and is referenced to as a schema.
b) The external way is a subset of the conceptual way and expresses the view of a given application programmer or user. It is referred to as a subschema.

c) The internal way is the set of files which materialize the conceptual way in the computer. It represents the physical data-base description.

4. Data base approach.

Many authorities categorize the approaches to data base representation as hierarchical (tree structured), network (plex-structured) and relational (normalized structure).

a) Hierarchical model

The hierarchical model is based on a tree structure in which relations between data items or records are of type. 1:N.

Each tree is composed of a root and leafes enabling access to various levels of data. The root is located at the highest level and the other sets of data at the levels of nodes of the tree. A node is therefore a set of attributes describing the entity at this node. Each node is linked to another unique node at a higher level called its "parent" and many be linked to one or several nodes at the lower level. These nodes are called its "children".

The hierarchical model is based on hierarchical file structures forming a tree structure between records.

b) Network approach

In a plex structure, a child can have more than one parent. Family tree including men as well as women would be a plex structure. Any data item therefore can be linked to any other data item. As with a tree structure, a plex structure can be described in terms of children and parents.

The schema is represented in a form of network connecting record types through logical pointers.

c) Relational data bases

The relational model is based on the mathematical theory of relations. A relation is a table in which each column is an attribute. The schema of relation is simply the name of the relation followed by the list of its attributes. In mathematical language, given the list of sets S1, S2, ..., Sn, R is a relation on these n sets if it is a set of n-tuples each of which has its first element from S1, its second element from S2 and so forth. Each of the sets S1, S2, ..., Sn are called domains. A relation is therefore a two-dimensional table where columns are domains and lines are tuples. A named domain is an attribute. The ordered set of attributes enabling the identification of a tuple is a key. The key must have two properties:

- In each tuple of a relation the value of the key must be uniquely identify that tuple.
- No attribute in the key can be disgarded without destroying the property of unique identification.

The key of flexibility in a relational data base lies in the ease with which relations can be manipulated. Relational mathematics defines a variety of operators with which relations may be manipulated to achieve any desirable tabular representation of the data. A fundamental characteristic of the relational model is the possibility to manipulate relations through means of powerful logical operations in order to generate desirable relations from existing relations.

Possibilities of manipulating data:

The relational calculus is an non-procedural language by which users indicate what they need without having to indicate the stages required for procedural manipulations to be performed on the model to achieve the desirable result.

The relation algebra is a procedural language by which users manipulate the relations of the model by using relation algebra operators (projection, join, union, etc.) in order to obtain the desirable result. These operators are high-level operators for data manipulations without using the concept of physical access paths.

The tuple by tuple language is used by a programmer to proceed a record or tuple at a time. It enables him to go from a tuple to another during each operation and to derive the data to be used. It is the lowest level data base sublanguage.

An issue of concern to most data base designers is what data items should be grouped together. It is very important to think out the grouping of data items since the inception of the data base in order to avoid modification of user's view, rewriting of programmes, etc. The normalization is a process which consists in replacing one complex relation by a series of simpler relations. The objectives of normalization are as follows:

- Make possible the representation of any relation in the data base;
- Obtain powerful data recovery procedures based on series of simple relational operations;
- Free all relations from non-desirable dependence vis-a-vis data manipulations;
- Minimize needs of rebuilding relations when data types are inserted;
- Free relations from nature of requests which may change with time.

5. Management.

a) Role of the data base administrator

The data base administrator is the person which will have to design and maintain the data base structures. He controls the overall structure of the data. His is the custodian of the corporation's data.

A bank manager is the custodian of what is in his bank vault but not its owner. The data base administrator is responsible for safe keeping and controlling the data, which does not mean that he knows the content of the records.

If the data item must be expanded from six digits to seven digits, only the data base administrator can accomplish this change.

b) Integrity

When a data base contains data employed by many different users it is important that the data items and associations between data items not be destroyed.

Hardware failure and various types of accidents will occur occasionally. The storage of data and its updating and procedures, must be such that the system can recover from these circumstances without harm to the data.

It is essential that a procedure should exist for reconstructing data that are vital. To make reconstruction possible, parts of files must be copied periodically and as file updating proceeds, certain data items must be logged.

The copies and the log may be recorded on an inexpensive storage medium, such as tape, which can be stored away from the computer center.

In addition to protecting data from system problems, the integrity checks may also be designed to ensure that data values conform to certain specified rules. Tests may be made by checking the relationship between several data values.

c) Security

Data in data base systems must be kept secure and private. The more vital the information in data bases become, the more important it is to protect it from hardware or software failures, from catastrophe and from criminals, vandals, incompetents and people who would misuse it. Security is a highly complex subject because there are so many different aspects to it.

Any system analyst responsible for the design of security measures, needs to be familiar with all features of the system because the

system can be attacked or security breached in highly diverse ways. For data base security, the following requirements are essential:

- The data should be protected from fire, theft, or other forms of destruction;
- The data should be reconstructable because, however good the precautions, accidents sometimes happen;
- The data should be auditable;
- The system should be tamperproof; ingenious programmers should not be able to bypass the controls; (Today no system is completely tamperproof, but bypassing the controls can be made extremely difficult);
- Users of the data base must be positively identified before they can use it;
- The system must be able to check that users' actions are authorized;
- Users' actions should be monitored so that if they do something wrong they are likely to be found out.

In a multi-user environment of a data base, privacy controls are necessary to ensure that an unauthorized person or program does not read, modify or damage somebody else's data. The privacy controls range from being very simple, such as pass records on files to highly elaborate programmed procedures, such as controls on the use of statistical data base. These controls may be an application program procedure, a data base management system procedure, a facility of the operating system or a combination of these.

d) Performance

Where on-line access to data is needed, the most important factor is the time it takes the system to respond. It is desirable to store the frequently referenced data in such a manner that they can be accessed quickly and conveniently and by removing those rarely accessed data and store them in a cheaper fashion.

To improve the performance of the data base it is necessary to have physical data independence and secondly to monitor automatically the

usage of the data base so that appropriate adjustments of the storage organization can be made. This should be a continuing process.

Access time or transaction outputs may be of more concern to the users carrying out dialogue with computer terminals. These users need fast response time. If we define the response time as the interval between the last action the terminal operator takes on input and the first character of the response being printed or displayed, many dialogue systems need a response time of 2 - 3 seconds. Some techniques which tend to be faster:

- Lengthy updates deferred until later;
- Insertions or deletions deferred to off-line operation;
- Redundant storage of certain items designed to minimize the response time;
- Creating inverted list structures;
- Relations in a unit separate from the data;
- and so on.

e) Search capabilities

The user of data base may ask a wide variety of questions about the data that are stored. In general and in the majority of today's organizations the types of queries are anticipated and the physical data organization is designed to handle them with suitable speed. But what about unanticipated queries and spontaneous requests for information at a terminal? For these kind of queries the search would be done sometimes on the entire data base, and have to be fast. The response time is highly dependant on the physical data organization.

f) Powerful users languages

Powerful languages which permit untrained users to query, search and update data in a data base, to manipulate the data and to generate reports or documents which use it are now coming on the market. They permit some end users to bypass the application programming step. It is necessary to achieve this so that the users know easily and understand the data available to them. A data dictionary defining all data items used is also needed.

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ELECTRONIC DATA PROCESSING AS A TOOL FOR SMALLER INFORMATION UNITS

(Paper delivered on 22/2/79 during an EADI-Seminar)
by Dr. B. Brodmeier (DSE)

1. Introduction

Over the last ten years both the operating speed and the reliability of computers have increased markedly. At the same time, thanks to integrated microelectronic circuits, the physical size and the cost of storage have been reduced by factors ranging from 100 to 1000. Many sophisticated hardware capabilities, associated a few years ago only with expensive large-scale computers, are now being offered as standard items on low-cost minicomputers.

2. Applications

Suitable for EDP are above all tasks which call for the processing of large volumes of data resulting from routine functions or the comparison of large volumes of data with respect to specific symbols. EDP is also practicable whenever data must be rapidly available and wherever there is a high incidence of data alterations (institutions, persons, events).

Typical EDP usages are as follows:

- producing of indexes,
- cataloguing,
- processing of vocabularies,
- information retrieval,
- updating.

A further area of EDP application is that of data exchange with those institutions which transfer all their data in magnetic tapes.

Furthermore, data supplied on magnetic tape is cheaper than data supplied in the form of paper printouts.

a) Producing of Indexes

EDP is very useful when indexes must be produced. The data can be indexed according to various classifications. We distinguish, for example, the following:

- author index,
- index of corporate bodies,
- geographical index,
- subject index.

The amount of time and money saved thereby is considerable. A further advantage of considerable weight is that annual indexes can be cumulated to produce an overall index.

If the need is to produce an index of titles in the interest of express information, so-called "context methods" can be made use of, whereby the more or less full context is given along with the index entry.

In the KWIC Index (Keyword-in-context) the search term is moved to the left and the context follows to the right.

In the KWOC Index (Keyword-out-of-context) the search term is moved to the left and the entire text, including the search term, follows to the right.

b) Cataloguing

EDP also facilitates the task of cataloguing. The data can be catalogued according to various classifications, similarly as is the case in producing indexes. We distinguish, for example, the following:

- author catalogue,
- subject catalogue,
- geographical catalogue.

c) Processing of vocabularies

In this context the term "vocabularies" covers term lists, thesauri, UDC, etc. EDP can be of great help in compiling and processing vocabularies, usually quite extensive. The following tasks are involved:

- sorting according to various criteria,
- frequency statistics,
- automatic entry of cross-references in thesauri,
- updating,
- additions,
- production of various listings (alphabetical, systematic, subject field).

d) Information retrieval

The use of EDP in the task of information retrieval is above all of practical advantage when the inquiries of the users are of a complex nature (that is to say, when a great many search symbols are required in order to answer an inquiry in full) and also when the storage is voluminous (that is to say, where a large volume of stored data must be searched in order to reply to an inquiry).

Information retrieval can take the form of either on-line processing or batch processing.

e) Updating

Where types of documentation are involved which must be frequently updated (for example, research studies, institutions, persons, events), EDP can be very useful. By means of a simple instruction incorrect information is cancelled and replaced by the correct information.

3. Preconditions

If the use of EDP in the field of documentation is not to lead to disappointment and excessive costs, the EDP user must fulfill a number of preconditions. The user must on the one hand acquire expertise in EDP technical characteristics and specificities and on the other hand undertake an exact analysis of the entire documentation process and the specific steps involved under the aspect of EDP requirements.

With regard to EDP requirements, the following are important:

- The data must be structured;
- The data to be processed must be available in machine-readable data medium form; if they are not processed on-line
- The meaning (semantics) of a data element plays no role in its processing. The result is that input, output, and retrieval can become problematical.

The process of introducting EDP involves a number of steps, including the following:

a) Selection of the computer system

The manner in which data is processed (structuring, indexing, retrieval) is largely dependent on the type of system selected.

To the phase of system selection belong the following steps: development of a technical duty-manual; check of manufacturer's offers; selection of 2-3 systems to be tested; selection of the system to be bought.

b) Structuring of data

In order to structure data, a data acquisition scheme must be developed. Each type of documentation (for example literature, institutions, persons, events) must have its own data acquisition scheme (see DSE/ZD data acquisition schemes).

The type of data acquisition scheme developed depends on

- available hardware,
- available software,
- user needs (the data elements chosen must be in alignment with user needs).

A data acquisition scheme consists of formatted fields, or categories, in which the data elements are always entered in the same form (for example author, corporate body, title, subject, words, etc.). When the data is properly structured, the computer has rapid, direct access to the individual data elements needed for an index or a retrieval, for example.

DSE/ZD (DSE Documentation Centre) uses EDP for indexing purposes. The computer must therefore have direct access to the following categories:

- category 20 in order to compile an index of corporate bodies,
- category 30 in order to compile an author index,
- category 70 in order to compile a geographical and a subject index.

c) Development of a worksheet

On the basis of the data acquisition scheme a worksheet must be developed. The data elements are then entered (examples are the ISIS worksheet, the DSE/ZD worksheets, and the PADIS and POPIN worksheets).

d) Development of acquisition rules

Acquisition rules must be developed which regulate the entering of data elements in the proper fields of the worksheet. This ensures that the acquisition of data elements always proceeds in the same manner, a prerequisite to subsequent computer processing.

e) Development of writing instructions

Independently of whether the data elements are fed in on-line or via data medium, writing instructions must be developed in order to ensure uniformity. If strict uniformity is not observed in all categories, this may give rise to misinterpretations by the computer.

f) Observance of standards

Above all in steps b) to e) national and international standards must be adhered to, since they are prerequisites to the smooth functioning of information exchange. Only when data elements are standardized can data exchange take place.

g) Development of software

Not all minicomputers are equipped with the software required to discharge all functions which a documentalist may have need of. If

suitable software is not available, new programmes must be developed.

4. Problems

Only a few of the problems involved in using EDP will be dealt with.

a) Processing problems

Data processing via computer calls for much more exactness in work than is the case when processing is done manually.

b) Hardware problems

A minicomputer is still disadvantaged vis-à-vis a large-scale computer in that processing takes longer and storage capacity is smaller. However, it is only when large volumes of data are involved that these disadvantages make themselves felt. When a great deal of stored data must be searched, a large-scale (and consequently more expensive) computer with a maximum storage capacity and consequently a sophisticated retrieval system should be given preference.

c) Software problems

Not all minicomputer systems have software which is suitable for all documentation tasks (for example file linkage, assistance in indexing, automatic translation). The development of software in this field is still continuing, and it can therefore be expected that in a few years many more programmes will be available.

d) Character set

The character set on terminals and line-printers is somewhat restricted, and this causes problems when diacritic characters are required for languages being processed. Oriental and Asian languages fall under this category.

5. Example of minicomputer systems in information and documentation

The following examples are of interest to those institutions which require a data base system for information and documentation but which cannot afford expensive equipment and have no means of sharing a larger computer facility.

a) MIDONAS

MIDONAS (Military Documentation System of the Swiss Department of Defence) is a time-sharing general-data-managment-system based on the Digital-Equipment-Corp. (DEC). MIDONAS is installed on a DEC-Computer PDP 11/40 with a 64 k-byte memory and a 40 megabyte disk-pack-drive.

This documentation system covers the following types of documents:

- books,
- abstracts,
- technical studies,
- laws and legal texts,
- topographical maps,
- administrative texts.

The full text of most of the originals are stored on microfilms and can be searched on microfilm-reader-printer-units. For this purpose MIDONAS is supported by a 3-M automatic-search-microfilm-cartridge-system. The microfilm cartridges contain the full-text of the original documents.

MIDONAS has three functions:

- acquisition facilities,
- administrative facilities,
- on-line retrieval.

b) IDRC

The International Development Research Centre (IDRC) in Ottawa has developed an interactive minicomputer-system for information processing. This is an inexpensive and flexible system which is suitable for use in developing countries. In developing this system, the following principles had to be adhered to:

1) The system should be totally modular so as to promote ease of maintenance and extension;
2) The system should be simple to understand so that it could be implemented and used with minimum effort;
3) A user-attractive language should be provided so that users could really be users, and not high qualified documentalists or information officers;
4) The system should be able to provide a wide variety of outputs;
5) The system should have the capacity to accept outputs from other information systems;
6) The system should be viable within a small organization;
7) The system should be compatible with other international systems, such as AGRIS, ISIS, DEVSIS.

The software for the IDRC-documentation-system is based on the ISIS/ILO (Integrated Set of Information Systems) and has been further developed by IDRC.

The minicomputer-system runs on an in-house Hewlett-Packard 3000 series II machine. IDRC has a data base of some 20 000 records representing both monographic holdings and analytics and a serials data base of some 3000 records.

To handle the user needs it was decided to implement seven functions, three for data entry and four for data retrieval.

For data entry the system has

- the INPUT function, which permits the user to enter new records into the system;
- the MODIFY function, which permits the user to make changes to records already within the system. Fields can be added, deleted, replaced, or changed, and information in one field can be transferred to another field;
- the RELEASE function, which permits the user with appropriate security clearance within the system to release or delete records.

For data retrieval the system has

- The QUERY function, which enables the user to search data bases interactively or in batch. This function has facilities for both Boolean retrieval and free-text retrieval. Two kinds of search method are available with Boolean retrieval, namely, entering one term at a time or entering all selected terms at once. The items found in a search can then be displayed on the screen and/or be printed on the lineprinter for delivery to the user;
- the SDI function, which enables the user to search on a portion of the data base;
- the INDEX function, which permits the user to generate outputs in any sequences that may be desired, e.g. KWIC or KWOC indexes; alphabetical, author, or title listings. INDEX can also handle the UDC sort sequence (the Universal Decimal Classification is used in the IDRC Library);
- the PRINT function, which does all the printing for the system (e.g. the outputs of the INDEX and QUERY function). The PRINT function enables the user to specify the format for printing each record and to specify page layout (number of records per page, whether printed in columns, tables, etc.). PRINT is very flexible. Printing can be done on special forms or plain

paper and can be output to a terminal, a line-printer, or another device.

c) DOMESTIC

DOMESTIC (Development of Minicomputer Applications in an Environment of Scientific and Technological Information Centers) is intended as a generalized modular system which contains different programme units and which can be implemented as a "black box" and thus integrated in information centres without imposing unrealistic manpower and management requirements. From the start, the system should be able to handle data base creation, update, and maintenance as well as to accommodate information retrieval functions.

At present [1979, the Editors] DOMESTIC is in the pilot system design phase as a joint venture of Kayser-Threde GmbH, Munich, and the National Center of Scientific and Technological Information (COSTI), Tel Aviv.

Priorities for implementation are such that Phase 1 of DOMESTIC centres largely on data base creation, update and management, and information storage and retrieval modules.

In DOMESTIC 1, data bases will be created off-line but updated and managed in real time (on-line).

The two project teams are each utilizing different hardware configurations in their development work (DEC PDP 11/70 in Israel, Philipps 857 in Germany). All applications and interface software are designed to be transferable from the one machine to the other.

6. Conclusion

Minicomputers have now reached a stage of maturity which enables them to deal inexpensively and effectively with many information

processing activities, provided that adequate mission-oriented software is available.

7. International Standards

UNISIST Reference manual for machine-readable bibliographic descriptions; UNESCO, Paris 1974

ISO 690 Bibliographical references - Essential and supplementary elements

DP 5963 Indexing principles (Draft Proposal)

ISO 214 Abstracts for publications and documentation

ISO 833 International list of periodical title word abbreviations

ISO 639 Symbols for languages, countries and authorities

ISO-Standards for conversion of written languages like slavic Cyrillic, Arabic, Greek and Hebrew

UNISIST Guidelines for the Establishment and Development of Multilingual Thesauri; UNESCO, Paris 1976

ISO 2788 Guidelines for the Establishment and Development of Monolingual Thesauri

PROBLEMS OF AUTOMATING LIBRARIES IN A DEVELOPING COUNTRY: KENYA

by J. Were

Introduction

Use of computers in Kenya goes back to the mid fifties when computers first arrived on the Kenyan market. Since then, the industry has developed very first with major International computer manufacturers such as IBM, ICL, NCR, Wang, etc., being locally represented.

Despite this first growth, library automation remains unexplored in the computer industry in Kenya. Up to date, only a few libraries, mostly international, like ICIPE, UNEP, etc., have ventured into this new technology. There are several problems that have contributed to this slow move towards library automation.

Problems

Problem 1: Size of libraries

Most libraries in Kenya operate on a very small scale, serving only a few specialised kind of users who in most cases know what they want from the library. They have therefore never been confronted with serious problems that would make automation a necessity.

Problem 2: Lack of awareness among local libraries of the capabilities of computers

Computer illiteracy is still on a wide scale in Kenya. Most librarians are not aware of what computers can do for them. For those who are aware, they do not know how to got about it. Some libraries have

access to either the organization's computer or to micros but have made no effort to make use of the machines.

Problem 3: Lack of appreciation by national decision makers of the role of libraries and other information centres

The importance of using libraries in this country is emphasized at University level. School libraries have not yet developed to the level of enabling school leavers to realise the role libraries have played in their academic life. It is very difficult to convince such people when they get into key positions that money should be spent on developing libraries. To them it is certainly not a priority.

Problem 4: Financial limitations

Libraries in developing countries are forced to turn to donations for high technology projects. Not only are donations becoming scarce but they come with several hidden problems. Recipient institutions tend to underestimate the financial implications of such aid:

- No provision is made for possible enhancements of the donated equipment which have to be financed locally. The donor will often given the minimum configuration.
- No provision is made for long term professional systems and programming staff required to maintain the system.
- There is lack of awareness of the financial implications resulting from such running costs as maintenance, spare parts, stationary, additional storage facilities, etc.
- Lack of awareness of the limitations of the software provided in the package.

The institution, being financially unprepared, finally finds it too expensive to run the system donated.

Problem 5: Use of the organization's computer

In the absence of a donation, a library in a developing country would be tied down to using the organisation's computer if they have to automate. Use of such an installation has its own limitations:

- There is always a conflict between the library's requirements and the policy decisions at the computer centre on priorities. The library is often considered last after all other departments.
- Time-sharing environment on mainframes are unsuitable for the circulation requirements of libraries. Depending on the type of machine and on how many users it supports response time can be very inconveniencing.
- Shared storage facilities on the computer is yet another problem. Library files are often very large. The Union Catalogue at the University of Nairobi Library, if put on the computer would require roughly 120-MB (Megabytes) of disk storage. The computer centres tend to respond with reluctance to such storage requirements.

Problem 6: Limited choice of library systems

Distance from manufacturers of systems (available in developed countries) limits the scope of choice. Turnkey systems such as Geac, Plessey Pen, Automated Library Systems (ALS), etc, are still considered the best for libraries. These are systems specially designed for libraries by firms that are devoted to library systems and who are therefore well conversant with library problems. None of these firms is currently represented locally. Maintenance becomes a serious problem when one is considering the possibility of using such systems. The only alternative left for libraries in developing countries is to use unbundled systems.

Problem 7: Ignorance of local computer specialists regarding library automation

Computer firms in Kenya know nothing about library automation. Library problems are in many ways different from the normal business oriented problems which these firms are used to. One gets almost no help from these firms in terms of library software.

The local professional systems and programming people have no experience with automating libraries. Lack of this knowledge complicates communication between librarians and computer experts. On the other hand, lack of basic knowledge of computers among library staff also contributes to poor communication between the two groups.

Some librarians cannot identify their problems and requirements. The quality of the end product of any computerised system depends heavily on what information and how it is presented to the computer experts.

Problem 8: Retaining library staff trained in Computer Science

Computer science is a highly marketable profession and very well paying in private sectors. Librarianship on the other hand falls under the low-income professions in Kenya and it becomes impossible to retain library staff trained in this area. A professional supplement need to be paid to this people in order to retain them. Without this kind of inducement it becomes a very risky necessity to give library staff any formal training in this area.

Problem 9: Lack of sufficient knowledge of the local computer market

Librarians trying to automate should be sufficiently conversant with the local computer market to avoid unnecessary expenses and complications involved in importing a system. Local window shopping is rarely considered. The availability problem will often affect the

software but the hardware needs in most cases can be efficiently met locally.

Maintenance is an important aspect in automation which should not be overlooked. It is highly risky to install a system which cannot be maintained locally. The best alternative for most developing countries at the moment is to shop for a software package and acquire a suitable micro or mini on which it can be used.

Problem 10: Lack of Co-operation among Librarians

Librarians tend to keep professional information they have acquired to themselves. This in Kenya has played a role in retarding development of new technology in libraries. One finds that there is nobody to learn from due to unawareness of what exists. Eperiences of others help in lowering the risks of automation.

Cooperative systems which are part of the choice in developed countries are still lacking in developing countries. The tendency in Kenya is to go alone. Each librarian wants to run his/her own show. It would be wrong to say that cooperative systems are the best but under such strenous financial situations one gets tempted to advice on an attempt to put together the scarce resources available.

Libraries in developing countries should work towards selfreliance. Information sharing would be a great contribution to this aim. Knowledge acquired through seminars, workshops, training programmes or even donation projects should be passed on to others through publishing in national library journals.

Local experts should be appreciated and used to lessen dependancy on foreign expertise. National Library Associations should undertake the responsibility of making librarians aware of who is doing what in automation to encourage information and resource sharing. Libraries and other information centres should work hand in hand towards the

formation of local databases. Hopes of accessing international databases from a developing country in Africa are very slim.

Concluding Remarks

Though computers are increasingly becoming unavoidable tools in our daily work, libraries in developing countries should approach automation with great caution. Considering the poor financial situation facing developing countries, librarians in such countries cannot afford to make mistakes.

Be it a donation or not using computers is an expensive exercise and one has to make sure that it is extremely necessary. However, the high rate of efficiency, speed and economic storage facilities arising from use of computers should not be overlooked in information handling.

The following questions are necessary:

1. Do we need a computer?
2. If yes, why?
3. Where and how to use it?

Question 1 should lead to a systems analysis of the present system which will enable the library to identify problems and requirements. All that might be required is to improve the manual system perhaps by trying a different approach.

Should the systems analysis confirm question 2 then we have to decide on what applications - Circulation, Acquisition, Cataloguing, etc., - need automation.

A few don'ts that have been experienced by others are worth mentioning:

- Do not go in for a system which cannot be maintained locally.

- Do not go in for in-house developed system if you can avoid it.
- Do not use the the organisation's computer if you can avoid it.
- Do not take donations for granted. Budget for them properly.
- Make sure you run the show, not the computer experts. It should never be assumed that computer experts will automatically fill in the missing links. It is up to the librarian to design what he wants. The computer person only translates it into computer language.

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USER NEEDS AND "PADIS" SYSTEM

by PADIS
(presented by F.K. Inganji)

For there to be an effective utilisation of available information being processed and disseminated by PADIS, PADIS needs to educate the Users. PADIS Products include the DEVINDEX AFRICA, a bibliographic publication containing development literature about various countries of Africa and Africa in general, microfiche copies of documents, and data bases. It may not be surprising to note that very few top administrators know the existence of PADIS, and what it could provide in terms of information.

Problem of demand

PADIS has began to give much attention to the demand side of information in Africa. This activity requires increased activation of the principal user groups and the creation of an environment where information processed and disseminated by PADIS would be required and utilised to a far greater extent than at present.

Activating of demand and effective utilisation of information may need to be separately tackled for these user groups in Africa through various promotional measures, besides appropriate educational and training programmes.

National information and documentation systems must initially be geared to the requirements of the principal user groups in each country. Such users would include government departments and agencies, research institutions and universities; production enterprises, engineering and consulting firms; professional and trade associations, development banks and individual entrepeneurs and researchers in various fields.

The nature of information requirements would vary considerably for these user groups as also for various production and service sectors. Governments would for example, require information on development policies in other countries as also the nature and extent of information flows. They may also require information on scientific and technological results and trends in different sectors. The information needs of research institutions would largely relate to bibliographical material and sources and information on development research activities and institutions in other countries.

Production enterprises and other user categories on the other hand would require information on technology sources, technological alternatives and implications and experience of use of different techniques and processes.

Apart from meeting the extremely wide and diverse range of information needs of major user groups, national information systems must also provide adequate delivery systems for dissemination of such information to end-users. The objective of national information systems should be to stimulate demand for information and to satisfy all user groups as far as possible, within rational cost constraints.

Present PADIS activities in regard to users

As already stated, users of PADIS system can have access to the following services offered by PADIS.

(a) Copies of published DEVINDEX-AFRICA, (13 volumes so far). These contain bibliographic description of documents on various countries of Africa, and Africa as a region.
(b) Copies of microfiche of documents.
(c) Print-outs of PADIS data bases. At the moment, the following are operational:
    (i) PADIS-COM - A component consisting of some bibliographic data bases prepared by the competent bodies at international, regional, subregional and national levels;

collected and made available to member States with the agreement of organizations responsible for producing the data.

(ii) PADIS-DEV - This is a PADIS bibliographic reference sub-system, concerning development sciences (originally called DEVSIS-AFRICA), managed by the Central Co-ordination Office of the Project (PADIS/CCO).

(iii) PADIS-STAT - A component consisting of a statistical Data base prepared with the close co-operation of ECA Statistical Division.

(iv) PADIS-CORE - A component concerning analytical descriptions of experts, institutions and activities connected with African countries, carried out under the Programme for Technical Co-operation Among Developing Countries (TCDC).

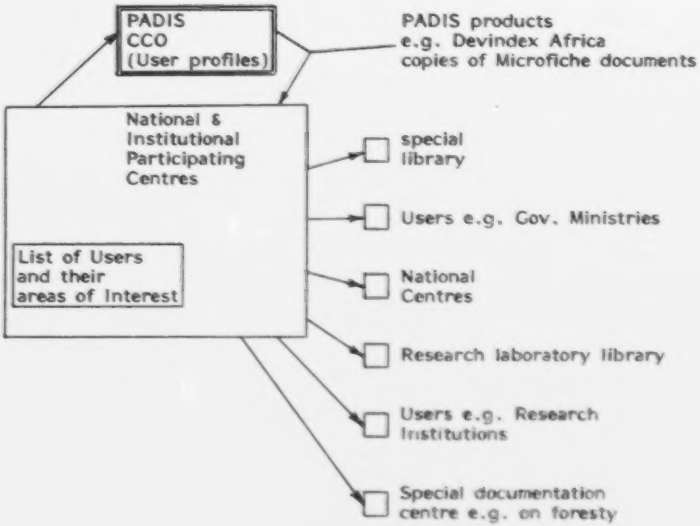
The Users Service Section within PADIS is presently engaged in some activities to enable users make a effective usage of PADIS products. Of mention at this point is an Selective Dissemination of Information (SDI) Service which is being started by PADIS. The objective of this selective dissemination of information (SDI) service is to alert users about new literature published on Africa both in Africa and world wide in subject areas of users. This is meant to save the users' time to allow them access to references not readily available.

This service by PADIS consists of information received from national and international organizations. Interest profile of individual subscribers will be regularly matched against the information available in the PADIS data bases, depending on the request made by a user, using PADIS HP 3000 computer. The results will then be sent to the user. This service will be offered entirely free of charge to users in Africa. Unless otherwise requested, not more than 100 references will be sent to individuals at anyone time.

The role of National Centres in facilitating user needs

National participating centres in PADIS activities will be expected to play a crucial role at national level in the identification and serving of users. It is encumbent upon the national centres to sensitize people within their countries on the services that PADIS can offer. National centres will then send requests to PADIS for specific information for specific users. National centres are crucial in this exercise in view of their strategic positions within their own countries.

SDI Service for African Users



Note: That it will be the responsibility of the national and institutional participating centres of nurture the interest of users and to facilitate their use of PADIS products.

REGIONAL COOPERATION IN INFORMATION WORK

by PADIS
(presented by F.K. Inganji)

Regional co-operation in the exchange of information for example in fields like Transport and Communication, Agriculture, Trade Development etc. should be seen by all African Countries as crucial to economic liberation. The majority of people in Africa are dependent on farming and animal husbandry. Their future livelihood is threatened by environmental degradation and in particular by desert encroachment as well as recurrent drought cycles. Sharing research information on this is useful especially on regional basis.

PADIS efforts to facilitate regional co-operation

For PADIS to effect regional co-operation in information work in Africa, it had decided to create subregional centres, namely the Eastern and Southern African subregional documentation and information system, (ESADIS), the Western African Documentation and Information System (WADIS), the Central African Documentation and Information System (CADIS), and the North African Documentation and Information (NADIS).

Reasons for the creation of subregional Centres

(a) The size of the continent, the large number of countries (nodes) and the State of Communications Services make it managerially impossible at this stage to contemplate a highly developed network.

(b) Networking based upon access through one intermediary (the PADIS Central Co-ordinating Office for instance) does not overcome the barriers and delays impossed by poor communication services.

(c) Networking with subregional centres and one regional centre as intermediate features and coupled with a suitable distribution of reference data bases and primary document deposition seems a better option.

(d) Such an arrangement as and when traffic rates justify it is favourable to enhanced applications such as postal courier services, partial use of telecommunications links between centres, etc.

(e) The other factor that dictates the existence of subregional centres does not have to do with the network aspect. Rather, it is called for by the need to intensify technical assistance delivery to emerging National Information and Documentation Centres (NIDC). Intensity of development action appreciates significantly through decentralization than under a centralized framework. It is believed that subregional Centres will serve as effective springboards for technical assistance to National Information and Documentation Centres and specialized documentation centres within their respective subregions. They will serve as sites for training programmes and will permit a higher degree of resource sharing particularly data processing equipment, reprographic facilities and specialized manpower.

Areas of subregional/regional co-operation in information work

As we all know, creating of documentation and information systems by individual countries is becoming a very expensive exercise. Needless to say, the acquisition of relevant information from mainly the industrialised countries is becoming exceedingly expensive. The lack of proper mechanism for collection, retrieval, processing and dissemination of relevant development information on Africa, led the African Governments to create PADIS. In order that all African countries benefit from PADIS, co-operation in information work of PADIS at regional and subregional level becomes crucial. The following are some suggested areas of regional/subregional co-operation:

(a) Exchange of research information to avoid duplication.

(b) Carrying out documentation and information training at regional/subregional level.
(c) Sharing data processing equipment, reprographic facilities etc.
(d) Sharing of specialized manpower.
(e) Joint acquisition of data bases.
(f) Production of DEVELOPMENT INFORMATION INDEX (DEVINDEX) at subregional level etc.
(g) Co-ordination of research, development and experimental work, elaboration of new designs for documentation and library activities at subregional level.
(h) Co-ordination of use and methodology of computer systems etc.

Conclusion

The development of International Co-operation and the establishment of international and regional information systems are characteristic features of the present stage of the development of information services. In addition, there is a rapid increase in the number of specialised material the development of electronic data processing and of computer-based indexing and literature searching services, the introduction of Selective Dissemination of Information (SDI) Systems, etc. Efficient regional information systems will provide solid bases for international co-operation in Africa. Interdependence between national and International systems call for extensive co-ordination of the technical and methodical sides of information system planning.

ANALYSIS OF EVALUATION QUESTIONNAIRE

by L. Hüttemann

At the end of the training workshop, an evaluation session took place during which the participants filled out a questionnaire and gave open comments regarding shortcomings and suggestion for future improvement of similar courses. In the following analysis, both parts of the evaluation session are combined when open questions of the questionnaire are dealt with. All twenty participants who attended this session returned the questionnaire.

1. Did the workshop meet your professional needs and those of your insitution?
   A ranking scale with 5 categories from 1 (= not at all) to 5 (= completely) was used. There were 8 answers in the middle category 3, 9 answers in the category 4 and 3 answers in the category 5. The response to this question shows that the workshop met the professional needs of the participants to a high extent.

2. Did the workshop fall short or exceed your expectations?
   Another 5-category scale was applied in which 1 represented a shortfall and 5 an excession of expectations. The answers were scattered in all categories with the majority in the middle category. In fact, the average was 3.05, which means that the workshop met the expectations of the participants in most cases. For 2 participants it fell short, and for only one it exceeded the expected level.

3. How was the length of the workshop?
   Three options were given in the questionnaire. The participants replied:
   - too long: 4 times
   - about right: 15 times
   - too short: 1 time.

Again, the vast majority of the participants felt that the two week programme was appropriate to what should have been achieved during the workshop.

4. How hard was the work in the workshop?

The questionnaire provided three options. Answers were

- harder then expected: none
- about as expected: 11 times
- less than expected: 9 times.

This response is a clear indication that the organizers could have put more pressure on the participants, most probably through more practicals.

5. How relevant for your work were the following workshop topics?

a) Data processing techniques
b) PADIS methodologies
c) Regional and international information systems
d) Introduction to software packages used in information work
e) User needs and regional and international information systems
f) Regional co-operation

A ranking scale with 5 categories from 1 (= irrelevant) to 5 (= very relevant) was used to obtain results which are shown in the table below:

	1	2	3	4	5	average
a)	2	-	6	4	8	3.80
b)	1	2	4	6	7	3.80
c)	-	2	3	7	8	4.05
d)	-	2	5	5	8	3.95
e)	-	1	4	6	9	4.15
f)	-	-	4	3	13	4.45

It can be said that all topics were relevant for the work of the participants in their home institutions. The highest average was

compiled for "Regional Cooperation", a topic which should be given more emphasis in future courses. The very nature of the workshop (bringing together many professionals from almost all countries of the Eastern and Southern African region) may have led to his result, because this specific target group of participants rarely gets the opportunity of exchanging professional views.

6. On which topics should more time have been devoted?

Participants were allowed to provide more than one answer. Thus, the number of replies does not correspond with the number of returned questionnaires. Out of all topics mentioned by the participants, there were 4 which got more than 4 votes:

- Introduction of software packages (8 times)
- PADIS methodologies (8 times)
- Data processing techniques (6 times)
- Data base managment (5 times).

It should be mentioned that participants stressed the argument that these topics should have been combined with practical applications and thus been allocated more time. The rest of the topics were mentioned between 4 and 2 times each.

7. Which topics should have been given less time?

Again more than one answer was permitted. 5 participants did not make any statement here; the various topics except one only got 1 to 2 nominations. The exception was the session on Microfilming/Reprography, of which 8 participants stated that it could have been done in less time. Unfortunately, this presentation was done by a private company and used as a promotional event. This should be avoided in future by either giving the opportunity to competing manufacturers or to a resource person with ample knowledge on different suppliers of equipment.

8. How could you describe the general administrative arrangements of the workshop?

The questionnaire offered three options (poor, good and very good) and mentioned:

a) Distribution of reading materials: poor (1)
good (12)
very good (7)

Participants were satisfied with the reading material provided to them during the workshop. The only complaint was that the material should have been distributed in advance.

b) Condition of lecture room: poor (8)
good (9)
very good (3)

The lecture room itself was considered suitable for the workshop, but it was just too noisy being adjacent to the Hotel car park entry. Very disturbing were also the many telephone calls for some of the participants who were called out of the lecture room. The rainy season also contributed to the low ranking of the condition of the lecture room.

c) Other (please specify)

Four colleguas regarded the hotel arrangement as "good", one as "poor". One participant rated the meals as "good", three as "poor". Two persons mentioned under "poor" the waste of time. One colleague categorized the open and sincere discussions as "very good". Another complained as "poor" the out-of-pocket allowance.

In general terms, it is justified to make the statement that the administrative arrangements made for the workshop were appreciated by the participants. There is, of course, room for improvement for future courses of the same kind.

9. What did you find particularly rewarding and what constructive criticism would you offer to improve this kind of workshop in future?

As stated earlier, the analysis of this question is based on written statements in the questionnaire and verbal statements during the open forum.

The positive aspects are described first: There were many participants who found the "Exchange of experience with other

professional from the region" most rewarding. Two colleagues mentioned the "field visits" as a highlight of the workshop. Three participants stated that "discussions were very useful" and two said that the most important aspect was "to acquire knowledge on PADIS". Several people were pleased by the "Administration" of the workshop.
Negative statements were made with regard to "the quality of some resource persons", the "different level and background of participants", the fact that a topic like "information retrieval" was missing, and that the "overall topic of the workshop was not really covered".

Suggestions for improvement (on the professional side) were:

- more time for practicals (10 times);
- more study tours/demonstrations, exhibitions (5);
- more external resource persons (2);
- "hands-on" computer (3);
- own workshop for topic: data processing techniques (2);

(on the administraive side):

- provision of stationery, folders and name tags (2 times);
- money for food instead of prepaid meals (8);
- papers to be distributed in advance (3).

The comments given by the participants are regarded as very useful for the preparation and realization of future workshops of this kind. Most of the suggestions can easily be implemented. The positive aspects will be strengthened, and the negative ones hopefully be eliminated. In an overall view this workshop, which was seen by the organizers as a pilot programme, has been a success, but at the same time a challenge to improvement for the future.

Annex 1: LIST OF PARTICIPANTS AND RESOURCE PERSONS

A. List of Participants

1)	Mrs. Stella B. Monageng Documentalist	Nat. Institute of Development Research Private Bag 0022 Gaborone/BOTSWANA
2)	Miss Zipho Ngcobo Ass. Librarian, Head Reader Services	University of Swaziland Private Bag No. 4 Kwaluseni/SWAZILAND
3)	Mrs. Ayahelush Getahun Team Leader	Ethiopian Technology Centre Development Projects Study Agency P.O. Box 3433 Addis Ababa/ETHIOPIA
4)	Miss Sylvie Ranaivoson Direction Attaché	Fonds National d'Investissement Maison des Produits, 67 Ha B.P. 719 Antananarivo 101/MADAGASCAR
5)	Mrs. Shewaneseshe Workneh Head, Technology Library	Addis Ababa University Libraries P.O. Box 1176 Addis Ababa/ETHIOPIA
6)	Mrs. Lina Ernesta Senior Librarian	Documentation Centre Ministry of Education and Information P.O. Box 48 Victoria, Mahé/SEYCHELLES
7)	Mrs. Sirad Yusuf Ismail Chief Librarian	Somali National University P.O. Box 15 Mogadishu/SOMALIA

8) Miss Mathetha Molapo Assistant Librarian	Nat. University of Lesotho P.O. Box 180 Roma/LESOTHO
9) Miss Dikeledi Setlogelo Senior Librarian	Lesotho Nat. Library Service P.O. Box 985 Maseru/LESOTHO
10) Mr. Washington O.Ochiengh Head, Reader Service Division	Moi University P.O. Box 3900 Eldoret/KENYA
11) Mr. Aldo J. Mkessa Ass. Librarian, Technical Services - Acquisition	ESAMI P.O. Box 3030 Arusha/TANZANIA
12) Mr. Wycliffe C. Mushipi Head, Documentation and Information Centre	Nat. Council of Scientific Research P.O. Box Ch 158 Lusaka/ZAMBIA
13) Mr. E.A. Mwinyimvua Head, Documentation	Tanzania Library Service P.O. Box 9283 Dar es Salaam/TANZANIA
14) Miss R.M. Mwayi Principal Librarian: Branch Libraries Activi- ties	Uganda Public Libraries Board P.O. Box 4262 Kampala/UGANDA
15) Mrs. Dolores M. Thorpe Head, Dept. of Library and Information Science	Harare Polytechnic P.O. Box 8074 Causeway, Harare/ZIMBABWE
16) Mr. P. Guruvadoo Lecturer, Computer Education	Mauritius Institute of Education Réduit MAURITIUS

17) Mr. Tamba N. Komba Information and Documentation Officer	Centre for African Family Studies P.O. Box 60054 Nairobi/KENYA
18) Mr. G.K. Nagri Library Director	American Center Library (USIS) P.O. Box 9170 Dar es Salaam/TANZANIA
19) Miss Theresa Wanjiro Riunge Documentalist	Nat. Council for Science and Technology P.O. Box 30623 Nairobi/KENYA
20) Mrs. Edith K. Muthigani Science Secretary - I&D, Communication	Nat. Council for Science and Technology P.O. Box 30623 Nairobi/KENYA
21) Mr. Jona Owitti Ass. Science Secretary, Computer Operation Unit	Nat. Council for Science and Technology P.O. Box 30623 Nairobi/KENYA

B. List of Resource Persons

1)	Mr. Francis K. Inganji PADIS Training Programme Coordinator (Course Director)	UNECA/PADIS P.O. Box 3001 Addis Ababa/ETHIOPIA
2)	Miss Bethelehem Teshager Documentalist	UNECA/PADIS
3)	Mr. Kue Tusukina Mavuba Chief, Computer Operations Section	UNECA/PADIS
4)	Mrs. Petrina G. Amonoo Documentalist, POPIN-Africa	UNECA/Population Division P.O. Box 3001 Addis Ababa/ETHIOPIA
5)	Mrs. Jacinta Were Assistant Librarian	University of Nairobi Library P.O. Box 30197 Nairobi/KENYA
6)	Mr. Wo Yen Lee Director, INFOTERRA PAC	UNEP P.O. Box 30552 Nairobi/KENYA
7)	Mrs. Sylvaine Pillet Head, Information Systems Unit	HABITAT P.O. Box 30030 Nairobi/KENYA
8)	Mr. Greg Compley-White Export Manager, 3M	c/o Isaac Locho, 3M P.O. Box 48567 Nairobi/KENYA
9)	Mr. Richard Labelle Programme Coordinator, Information and Documentation	ICRAF P.O. Box 30677 Nairobi/KENYA
10)	Mr. Lutz Huettemann Head, I&D Training Section	DSE Bonn Postfach 300 380 5300 Bonn 3/FED.REP.GERMANY

Annex 2: PROGRAMME

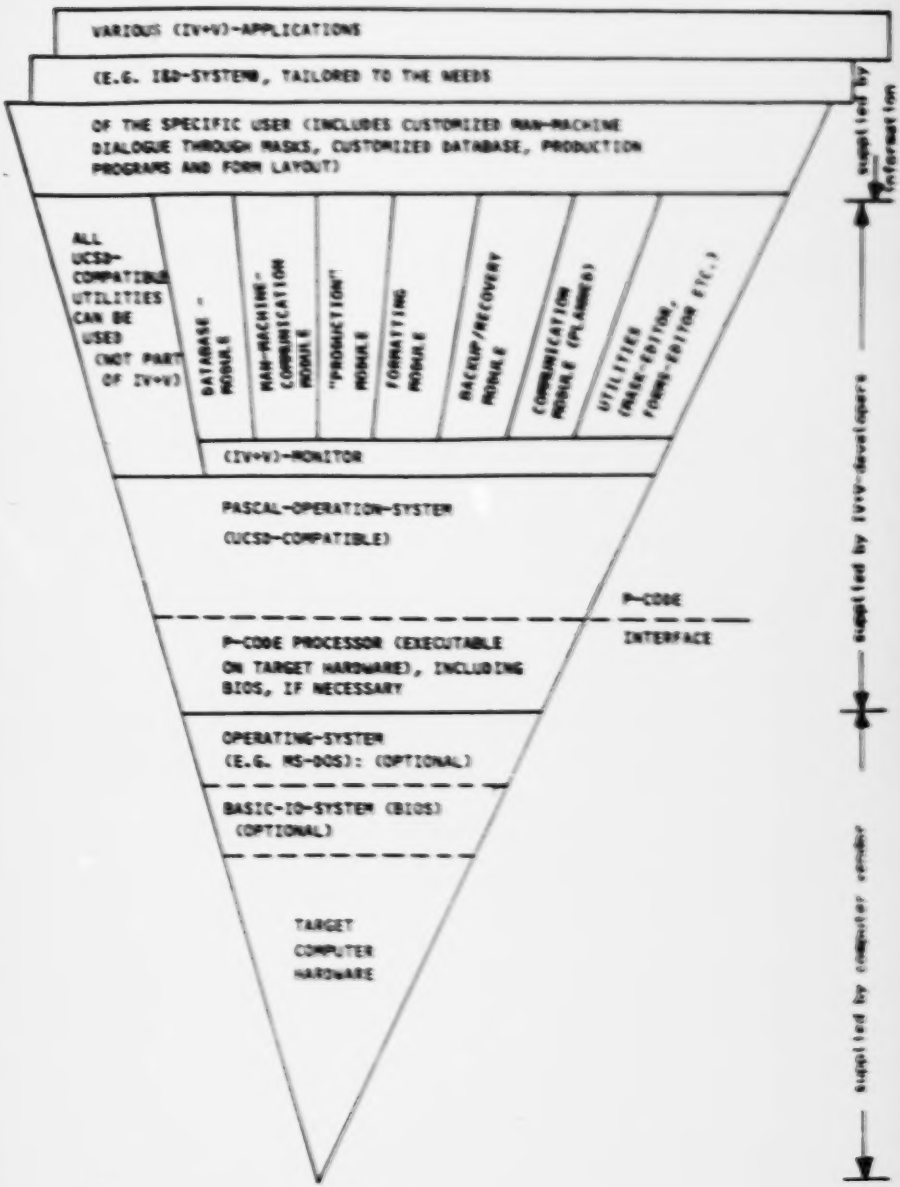
20.4.86:	Arrival of participants and resource persons	
21.4.86:	09:00 to 10:00	Registration
	10:00 to 10:30	Official Opening
	10:30 to 11:00	Break
	11:00 to 12:30	Introduction of participants and resource persons
	12:30 to 14:00	Lunch
	14:00 to 16:00	Keynote addresses (Inganij, Hüttemann)
22.4.86:	09:00 to 10:30	PADIS methodologies (Teshager)
	10:30 to 11:00	Break
	11:00 to 12:30	Discussion on PADIS (Teshager, Mavuba)
	12:30 to 14:00	Lunch
	14:00 to 16:00	Practical work with PADIS input sheets (Teshager)
23.4.86:	09:00 to 10:30	Information about PADIS (Inganji)
	10:30 to 11:00	Break
	11:00 to 12:30	Information about INFOTERRA (Lee)
	12:30 to 14:00	Lunch
	14:00 to 16:00	Information about POPIN Africa (Amonoo)
24.4.86:	09:00 to 10:30	MINISIS Software (Mavuba)
	10:30 to 11:00	Break
	11:00 to 13:00	Field Visit: HABITAT (Pillet)
	13:00 to 14:00	Lunch
	14:00 to 16:00	Field Visit: INFOTERRA (various staff)
	18:00 to 20:00	DSE reception
25.4.86:	09:00 to 10:30	PADIS without computerization (Inganji)
	10:30 to 11:00	Break
	11:00 to 12:30	Microfilming and reprography (3M)
	12:30 to 14:00	Lunch
	14:00 to 16:00	Reprography continued (3M)

26.4.86: Reconfirmation of return flights

27.4.86: Free

28.4.86:	09:00 to 10:30	Contribution of participants (Country Papers)
	10:30 to 11:00	Break
	11:00 to 12:30	Continuation of first session
	12:30 to 14:00	Lunch
	14:00 to 16:00	Information on ICRAF (Labelle)
29.4.86:	09:00 to 10:30	Data base management (Mavuba)
	10:30 to 11:00	Break
	11:00 to 12:30	Data processing techniques (Mavuba)
	12:30 to 14:00	Lunch
	14:00 to 16:00	Problems of automating libraries (Were)
30.4.86:	09:00 to 10:30	User Needs - PADIS (Inganji)
	10:30 to 11:00	Break
	11:00 to 12:30	User Needs - POPIN (Amonoo)
	12:30 to 14:00	Lunch
	14:00 to 16:00	Free afternoon
1.5.86:	Free (Public Holiday)	
2.5.86:	09:00 to 10:30	Regional Cooperation (Inganji, Hüttemann)
	10:30 to 11:00	Break
	11:00 to 12:30	Discussion on first session (Hüttemann)
	12:30 to 14:00	Lunch
	14:00 to 16:00	Evaluation (Hüttemann, Inganji)
	16:30 to 17:00	Official Closing
	18:00 to 21:00	Closing Reception (Participants and resource persons)
3.5.86:	Departure of participants	

Annex 3: (IV+V) - DIAGRAMME



Annex 4: PADIS STATUS REPORT

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United Nations
Economic Commission for Africa
Pan African Documentation and
Information System (PADIS)

PADIS Subregional Technical
Committee for ESADIS
May 1986

Nairobi, Kenya

PADIS STATUS REPORT

NOTE: This paper was also presented at the Fourth Session of the Joint Conference of African Planners, Statisticians, and Demographers, 3 to 12 March 1986, Addis Ababa, Ethiopia.

PADIS STATUS REPORT

A. INTRODUCTION

1. Interest on an African region-wide information system emerged in the Secretariat of the UNECA around 1976. By 1977/78 the earliest proposals for such a system appeared in the shape of the African Development Information Network (AFDIN). At about the same time there were other proposals for an African statistical data bank.

2. Further to these loose proposals, an interagency mission was commissioned in January 1979 to advise the ECA Executive Secretary on the design and establishment of a Pan African Documentation and Information System for social and economic development and to give guidance on how best to promote the participation of member States in the proposed system. This mission was composed of well known experts in the field who represented organizations that had considerable experience in executing information and documentation programmes. The mission submitted its report and findings to ECA in June 1979.

3. In the meantime, the ECA Conference of Ministers at its fourteenth session held in Rabat, Morocco in April 1979 endorsed Resolution 359(XIV) which invited the Executive Secretary of ECA to find the means to assist member States to create national numerical and non-numerical information systems.

4. Between June and December 1979, ECA negotiated with UNDP and secured the funding of a project for the creation, establishment and development of a Pan African Documentation and Information System for social and economic development (DEVSIS-AFRICA: RAF/79/078)

5. Project implementation started on 1 January 1980 from funds made available by UNDP and ECA.

6. This status report is an account of the activities undertaken since then to realize the objectives laid down for the PADIS Project. It attempts to report on progress made in several directions inclucing: establishment of a Central Co-ordination Office, delivery of technical assistance to member States, development of norms, standards and methodologies, provision of user services,etc.

B. CONCEPTS UNDERLYING THE PADIS PROGRAMME

7. PADIS signifies a region-wide cooperative information system and network. The PADIS Project is entrusted to realize this system and network which involves on the one hand, the organization and exploitation of available information resources and, on the other, the setting up of a network as well as the physical means for the transfer of information between network nodes.

Scope of the Cooperative Information System

8. The PADIS cooperative information system is a cross-sectoral system that handles both numerical and non-numerical information organized along missions, disciplines and/or sectors. The following are considered to be the subsystems of the system: bibliographic information; referral information for the promotion of TCDC; statistical information; non-statistical numerical technical information; and, extra-African scientific and technological information.

The Regional Network

9. The regional network is envisaged to consist of national, subregional and regional nodes. It will employ data transmission mechanisms that will be gradually refinec with the growth of participating centres, increases in data traffic and, possibly reductions in costs that are expected to accompany advances in technology. These nodes are defined as national information and documentation centres, four subregional coordinating centres, a central coordination office and a number of institutional participating centres located within regional and subregional organizations or centres of excellence.

10. The current level of development of information infrastructures in Africa (institutions, methods and concepts, manpower, technologies) will need to be enhanced significantly if the above are to be realized. Previous attempts at improving the situation have been hampered by the absence or ineffectiveness of policies and, also, by the low priority information and documentation activites had been accorded in national development perspectives. Needless to say, the latter has direct implications on the availability of financial and other resources.

The PADIS Approach at the National Level

11. It follows from the above that a comprehensive programme of action that will systematically and progressively eliminate the obstacles to developments in this field is essential. The approach being followed by PADIS, as regards the national level, focusses on creating an awareness at the policy- and

decision-making levels of Governments with a view to prompting them to identify and designate a body that is responsible for information and documentation affairs - the national information and documentation centre. It is in turn expected of this body, or of similar bodies that already exist, to spearhead changes in policies, plans and legislations and to introduce innovations in concepts, methods, skills and technologies.

12. The aim of the technical assistance activities of PADIS is to assist the national information and documentation centre or its equivalent, to discharge these responsibilities effectively and thereby to enable member States to benefit from and to contribute to the regional system.

13. The creation and development of such a centre depends on historical circumstances and the preferences of respective governments; the objective situation with regard to information and documentation activities; the availability of financial and manpower resources; etc. Member states could opt to gradually develop an existing centre or to establish an altogether new agency; to locate it administratively within the Ministry of Planning or Education; the Scientific Research Commission etc. so long as the main object remains that the national centre is given the mandate to develop and coordinate the activities of other national and sub-national information and documentation centres. The eventual aim is to set-up a national network that is linked, through the national centre, to other subregional, regional and international networks.

PADIS Subregional Centres

14. It is planned to establish four subregional information and documentation centres (SIDCs) in the Central, East and South, West and North African subregions. These centres will be administered by the Central Co-ordination Office of PADIS. The respective subregional technical committee for PADIS established by the ECA Conference of Ministers at its 19th session will oversee the implementation of the workprogramme in each subregion.

15. The major role of the SIDCs is to give thrust to the technical assistance activities of PADIS mainly by: providing on-site training programmes; promoting the sharing of resources such as EDP facilities, repregraphic equipment and high-level manpower which are either too expensive or uneconomical for emerging national centres to possess; and, by providing advisory services to member States and subregional non-governmental and/or intergovernmental organizations.

16. Furthermore, SIDCs will play a unique role in extending the PADIS network from the national to the regional level. This will be made possible by maintaining a depository of reference data bases and a collection of primary documents generated in the subregion. As such they will serve as

clearing-houses for documents and information generated in the respective subregions. SIDCs will be the link for information transfer between the Central Co-ordination Office and national centres, either through enhanced postal means, partial use of telecommunication, or both.

17. The roles of the SIDCs, however, will be modified depending on the needs of and the stages the development of information and documentation activities have reached in the particular subregions. In Sub-Saharan Africa SIDCs will be, for some time to come, preoccupied with technical assistance activities as opposed to their networking functions. In Northern Africa, for instance, the reverse might be true.

18. The territorial subdivision of the regior into subregions follows the regional groupings adopted by the ECA for its Multinational Programming and Operational Centres (MULPOCs) which are, at present, the hubs for subregional economic integration efforts (preferential trade areas, economic communities, etc.). It is anticipated that defining SIDCs within the geographical scope of such arrangements would intensify the integration (as opposed to the isolation) of information and documentation activities within the overall cooperation schemes of member States. Further, SIDCs will benefit from the administrative and physical infrastructure already available at MULPOC offices.

C. FINANCING

19. The PADIS Project is a multi-donor endeavour. It receives funds from the ECA, IDRC and UNDP and, at one time, from the ADB also. Negotiations have been underway with several other prospective donors including the EEC, the Government of France and Italy and the UNFSSTD.

20. UNDP's financial commitment to the Project over the last six years involves two phases and three projects (RAF/79/078, RAF/82/005 and RAF/81/037). During phase I, UNDP contributions under Project RAF/79/078 "creation, establishment and development of a Pan African Documentation and Information system for social and economic development" were used for consultancies, training and equipment.

21. During phase II, UNDP's participation under project RAF/82/005 involved consultancies, personnel, travel, individual and group training, meetings, computer maintenance, supplies and equipment and miscellaneous expenses. Project RAF/81/037 "Establishment of a Pan African Documentation Referral system for TCDC" constitutes the third UNDP financed and ECA executed Project. Funds were made available for personnel, travel, supplies, printing and miscellaneous expenses.

22. Similarly, IDRC's financial participation has now lasted five years covering two phases. Under phase I, IDRC'S financial support to the PADIS Project was used for personnel, consultancy, printing and training as well as for grants and assistance to participating centres. During Phase II IDRC had provided assistance for training, advisory services subregional services and the printing of the DEVINDEX-AFRICA.

23. The ECA's contribution to the Project was in the form of personnel, equipment, premises and utilities.

24. The contribution of the African Development Bank consisted of a grant that was utilized for salaries as well as for the purchase and installation of micro- and photo-reproduction equipment.

D. ESTABLISHMENT OF THE CENTRAL CO-ORDINATION OFFICE (CCO)

25. The implementation of the PADIS Project was initiated with the establishment of a Central Coordination Office at ECA.

Organizational Structure

26. The Central Coordination Office (CCO) of PADIS is directed by a Project Director who reports to the ECA Executive Secretary and through him to other legislative bodies including subregional technical committees, MULPOC legislative organs, the Regional Technical Committee for PADIS, the Joint Conference of African Planners, Statisticians and Demographers, the Technical Preparatory Committee of the Whole, and the ECA Conference of Ministers. The Joint Conference, upon the initiative taken by PADIS, has been expanded at its third session in 1984 to convene experts in information, documentation and informatics.

27. Within ECA itself, there exist three bodies that oversee one or another aspect of the PADIS Programme. The PADIS Users' Group is a forum for the exchange of practical experiences among individual users. The Electronic Data Processing Committee is a technical body composed of experts drawn from ECA's Substantive Divisions and who, in their individual capacity, advise the Project Director on EDP applications and other technical issues. The ECA Information and Documentation Board is a policy organ which, under the chairmanship of the Executive Secretary, sets guidelines for and reviews progress made in the execution of the PADIS programme at large. Further, the Board serves as a forum for the harmonization of the PADIS programme with other sectoral and mission-oriented plans that are led by the Substantive Divisions of ECA (e.g. statistics, natural resources, trade, population, economic and technical cooperation).

28. Financial, personnel and property administration of the PADIS/CCO is handled by the ECA Division of Administration and its respective sections that are responsible for such matters.

29. As regards the administration of technical assistance funds, the ECA Technical Assistance Coordination Office is responsible for the receipt of funds, the authorization of expenditures and the monitoring and reporting of project activities. Separate accounts are maintained for each project irrespective of the sources of funding.

30. Within itself, the PADIS/CCO is subdivided into the Computerized Documentation Section; Computer Operations Section; User Services Section; a unit for a referral information system for TCDC; a reprographic; printing and maintenance unit; and, the post of training coordinator.

Staffing

31. The PADIS CCO possesses twenty-five posts of which eight are professional, seven sub-professional technicians and ten support staff. Five professional and six support staff are engaged in EDP applications while the work of remaining professional and sub-professional staff is mainly related to information and documentation tasks. It can, therefore, be concluded that the size and quality of staff is insufficient to fully implement the workplan of the Project during its third phase.

Training of Project Staff

32. All project staff, both present and departed, have had to undergo either initial or refresher training after they joined the Project. There are three points to consider here:

33. Firstly, the workplans laid out in the project documents raised for PADIS had severely understated training needs for project staff. In fact, the only occasion training of project staff was mentioned is in the UNDP project document for Phase I, and even then, it was limited to the training of indexers in documentation techniques and analyst programmers. With advances in project implementation the need for staff development has progressively reached a higher order and the need at present embraces not only junior staff but also senior management staff.

34. As a consequence, staff development was a major area of project activity and it presently constitutes one of the outstanding achievements of the Project. For instance, the computer operations staff (computer operators, programmers, system managers) had to be retrained in order to be able to work on a computer brand that was the first to be installed in Ethiopia and that was five years ago, almost unheard of in the rest of Africa. In the case of the indexers (documentalists), months of on-the-job training and supervision (as opposed to the weeks

of training mentioned in the project documents) had to be conducted before it was confidently accepted that they were qualified. The same applies to staff members that were later transferred from the ECA/EDP Section to PADIS. Had the Project attempted to recruit staff that could immediately be put to use, then, most of them would have been international/professional staff that would have cost the Project by an order five to six times higher. In either case, never would have the resources of the Project allowed this.

35. Thirdly, in view of the scarcity/expensiveness of staff thoroughly acquainted with the equipment, software and methodologies in use at the Project and the resultant need to train them, one could assume the loss the high staff turn over could and has brought to the Project.

Installation and Maintenance of Computer Equipment

36. Further to the recommendations of the consultant engaged to advise on suitable software and hardware for the Project, it was decided to use the MINISIS software package which in turn determined the purchase of the Hewlett Packard mini- computer system. Due to the fact that Hewlett Packard is not represented in Africa, the equipment was supplied and installed by SERIT of Paris, France. This supplier has also been maintaining the computer and its peripheral equipment since its installation five years ago.

37. The capacity of the PADIS computer centre has expanded significantly since its initial installment in 1980. The configuration in use at present has the following capacity: 2 Megabytes of core memory; 1040 Mbytes of disc memory distributed on two disc drives of 120 mybtes each and two disc drives of 400 mybtes each; 52 terminals; two line printers of 1000 lines per minute; a graphic configuration; and other accessories including air conditioning equipment, optical card readers, etc.

Installation and Maintenance of Reprographic and Printing Equipment

45. The maintenance agreement entered into with the supplier has been respected which has contributed to the efficient performance of the equipment. However, malfunctions due to power fluctuation from the mains have been responsible for considerable down time.

58. Further to the recommendations contained in the report on the hardware requirements of the Project, a set of reprographic equipment have been purchased and installed. These include both micro-reproduction equipment (camera, developers, microfiche jacket fillers, microfiche readers, and microfiche reader/printers) and a heavy-duty photocopier. In addition a set of offset printing equipment (camera, plate makers and duplicators) has been acquired and installed.

E. THE ESTABLISHMENT OF SUBREGIONAL CENTRES

39. The establishment of subregional centres was initiated in 1983 following decisions taken by the Policy Organs of the Multinational Programming and Operational Centres (MULPOCs) of the respective subregions and which were subsequently endorsed by the ECA Conference of Ministers.

40. Practical implementation started with the order and purchase of two mini-computer configurations for the Eastern and Southern Africa Documentation and Information System (ESADIS) and the West African Documentation and Information System (WADIS) located at Lusaka (Zambia) and Niamey (Niger) respectively.

41. However, further progress has been impeded due to budgetary and administrative constraints. Funds for the recruitment of personnel and equipment maintenance are still unavailable. Attempts to transfer certain posts from the CCO to the subregional centres were aborted due to higher remuneration the staff are entitled to when posted away from Addis Ababa.

42. This has led the CCO to pursue interim arrangements with the host governments whereby the facilities of the subregional centres will be made available for use by the national information and documentation centres of the host governments for a period of two years and for which purpose PADIS will provide the requisite training for national staff. In return, the host governments were expected to provide personnel and sites for the centres.

43. In either case, the operations of ESADIS and WADIS in a manner that is commensurate with the roles they are expected to play will be possible only with the availability of fresh resources that can be used for personnel, maintenance and other recurrent costs.

44. The establishment of SIDCs in the remaining subregions is therefore being pursued more cautiously. Proposals for the North African Documentation and Information System (NADIS) were considered by the North African Subregional Technical Committee for PADIS during October, 1985 which has recommended that NADIS be housed at the Arab League Documentation Centre (ALDOC) in Tunis, Tunisia for an initial period of three years. The Policy Organ of the North African MULPOC will meet in early 1986 to take decisions on the recommendation and to determine the level of commitment from member States. It is hoped, in the meantime, that the results of requests made to UNDP/RBAS and the EEC will be known.

45. Similarly, the establishment of the Central African Documentation and Information System is delayed until reasonably durable financial resources are secured.

F. DEVELOPMENT OF NORMS, STANDARDS AND METHODOLOGIES

46. The significance the development and use of common norms, standards and methodologies hold for information exchange has led this activity to be one of the primary occupations of PADIS As a consequence of its multi-sectoral scope, PADIS was involved not only in the development of tools and methodologies for the classification and processing of bibliographic information but also for statistical and referral information on African experts, institutions.

Methods and Tools for Bibliographic Information

47. The development of tools and methods for the classification and analysis of bibliographic materials was a priority task of the Project. This was done following a comparative analysis of the diverse documentation tools utilized at the time by CDS/ISIS (UNESCO), AGRIS (FAO), CDS(ILCA), DEVSIS (IDRC) and UNBIS (UN Secretariat). The result of the analysis revealed that the tools used by these agencies were, though sophisticated, unnecessarily burdensome further to the fact that the compatibility between them could be considerably enhanced.

48. The document analysis guidelines (worksheet, manual in English and French) that were subsequently developed by the Project were found to be significantly simpler to use and virtually compatible with other existing systems. This fact was endorsed by the Technical Consultative Meeting on Compatibility with PADIS convened by ECA in April 1981 and which brought together experts representing sixteen organizations from within and outside the UN System. The Working Group on the Development of Common Indexing Tools convened by IDRC and UNDIESA in 1981 and 1982 respectively has endorsed, as ammended, the guidelines developed at PADIS as recommended methods for the preparation of bibliographic references to development literature.

49. Further, the CCO of PADIS has been designated as the regional co-ordinator for the maintenance and development of the Macrothesaurus for Information Processing in the Field of Economic and Social Development as well as the UNCHS Thesaurus for Habitat information. PADIS is a contributor to the third edition of the Macrothesaurus and the first edition of the UNCHS Thesaurus.

50. The Computerized Documentation Section of PADIS was one of the first few users of the MINISIS software package for textual (bibliographic) information processing. MINISIS is used for the computerized storage, processing and preparation of bibliographic outputs. Requisite applications for creation and maintenance of authority files, thesauri and conversion of external data bases are routinely developed. PADIS participates in the co-operative scheme to improve and develop MINISIS and it has hosted the 1984 MINISIS Users Group Meeting.

Methods and Tools for Referral Information

51. One of the initial tasks of the project for the PADIS Referral System for TCDC was the preparation of tools for the collection, storage and processing of information on African experts. The resulting guidelines (worksheet/questionnaire, instructions) have been utilized to establish and maintain the experts data base and to publish the Directory of African Experts. In the course of the first phase of this Project, draft tools for the collection of information on institutions and development projects have been prepared.

Methods and Tools for Statistical Information

52. As part of its responsibilities for the organization of available statistical information, PADIS has been collaborating with the ECA Statistics Division for the development of an African Statistical Data Bank consisting of three level of data bases. When work on these data bases is finalized, methodologies and computer applications for organizing statistical data at three different levels (country/national profile, statistical series and random access for modelling and simulation) will be possible. Levels II and III have already been attained.

6. INFORMATION COLLECTION, CLASSIFICATION, ANALYSIS AND EXCHANGE

53. Information work at the CCC includes the collection, classification, analysis, storage, processing and exchange of bibliographic, referral and statistical information.

Bibliographic information work

54. One of the primary functions of the Computerized Documentation Section of the CCC is to identify, select, classify and index development literature that is considered relevant to the work of socio-economic planners, researchers, academicians, technicians and the like. Therefore, the scope of the system is identical to that laid down for the global DEVSIS system.

55. To date, about 5000 documentary units have been identified, classified and indexed. The references (records) produced by these exercises are stored for computerized retrieval. As a result, the PADDEV data base presently contains 4918 references, of which 1300 (38%) are inputs from the national level.

56. The PADDEV data base has also been used to generate references for the DEVINDEX-Africa on magnetic media and ready for printing by photocomposition. Thirteen issues of this index to development literature on Africa have been printed in this manner.

Bibliographic Information Exchange

57. The second major function of the CDS is to maintain an exchange of data bases with other bibliographic information systems. To date, data bases are exchanged with LABORDOC (ILO), AGRIS(FAO) and Industrial Development Abstracts (UNIDO) which together contain 41,000 references. Files from ISU (UNDIESA) and DEVSIS(IDRC) are being awaited. The data bases are used to produce current awareness, SDI, and retrospective search services.

Document Delivery and Microfiching

58. Primary document delivery is provided on references cited in the DEVINDEX and the PADDEV data base in the form of microor photocopies. The current microfiche collection exceeds 4000 entries. Document delivery is not fully supported on externally produced data bases.

Referral Information Work IDRC

59. Referral information work, initiated under Project RAF/81/037, involves the collection, classification, indexing and retrieval of information on African expertise, institutions and development projects that could serve the purpose of TCDC. Accordingly, it has been possible during the first phase of the Project to collect and store profiles on 8400 African experts which have been computerized for retrieval purposes.

60. This data base on experts is processed to produce the Directory of African Experts, Volume 1 (3500 entries) and its four supplements (700 entries each). The sources of data for the first 3000 entries were other sectoral and discipline oriented directories while the remaining 5400 entries have been collected through questionnaires that have been dispatched via 300 institutions in fifty African countries.

H. TECHNICAL ASSISTANCE DELIVERY

61. The technical assistance delivery activities of PADIS emanate from the need to strengthen, at all levels, the existing information infrastructure. The main beneficiaries of this assistance scheme are African member States and regional and subregional organizations. The main elements of PADIS assistance are advisory services, provision of training, promotion of resources sharing and promotion of the use of common norms and standards. By strengthening information infrastructure at the national, subregional, regional and institutional levels such assistance is expected to give rise to a network of functional participating centres.

Advisory Services to member States

62. Advisory assistance to member States has focussed until now on creating an awareness at policy and decision making levels to prompt Governments to designate and/or establish their national information and documentation centres which will gradually assume the central role in the organization of the national resource in information. To this end model project documents have been submitted to all member States followed by field visits to the majority of the African countries.

63. As a result, encouraging and practical results have been achieved in Benin, Botswana, Ethiopia, Guinea, Niger, Togo and the Sudan. In Benin, the Government has set-up the "Centre National Automatise pour le Documentation et Information" (CENADI). The establishment of CENADI is being finalized with the assignment of personnel, the training of local staff and the installation of equipment. In Botswana, the Government has taken decisions to gradually develop the documentation unit of the Institute of Development Research into a national centre which will act as the PADIS focal point. In Ethiopia, the Government has decided to establish the Ethiopian Documentation Centre under the aegis of the Development Projects Study Agency. In Togo, it has been decided to gradually develop the documentation centre of the Ministry of Industry into a national centre. In the Sudan, the National Documentation Centre of the National Council for Research has been designated a national centre. In Guinea, the Government has decided that the Institut Central de Coordination de Recherches et de Documentation en Guinea be gradually developed into a national centre.

64. In some other cases, discussions have reached advanced stages and official communication from governments is being awaited (Algeria, Zaire). In Niger and Zambia negotiations are underway to arrange the working relationships between the future national centres and the subregional centres to be established there.

Provision of Training

65. PADIS offers training programmes to two categories of staff from national or institutional participating centres: orientation courses to senior level staff in the management of documentation and computer centres and practical training in documentation skills and techniques to medium level technicians. Further, provision of training takes the form of group training at the national level to staff drawn from several centres; regional and subregional seminars/workshops for higher level staff at the CCC; and, on-the-job training at the CCC.

66. Accordingly, five group training programmes were organized in Benin, Botswana, Guinea, the Niger, and Zimbabwe for the benefit of documentalists from various ministries.

67. Nine senior staff from documentation centres in Guinea, Lesotho, Botswana, Togo and Benin were received at the PADIS/CCO to undergo an average of four weeks' orientation courses in the management of computerized documentation systems.

68. Further, senior staff from the African Regional Centre for Technology (ARCT) and the Kagera Basin Authority have been received here to undergo on-the-job training in the management of documentation systems.

69. Recently, a one week training seminar on PADIS methodologies was held for participants from Algeria, Guinea, Togo, the Sudan, Tanzania and Botswana.

Resources sharing

70. Within the PADIS technical assistance scheme, resources sharing is an arrangement whereby expensive resources that are required for the advancement of information and documentation services are shared amongst a number of emerging centres until such time that they develop their own capabilities. High level (specialized) manpower, computer support and reprographic facilities are particularly amenable to resources sharing.

71. Within this context, the manpower and computer equipment available at the PADIS Central Co-ordination Office have been utilized: (a) to provide training in the setting up of documentation systems, etc.; (b) to produce data bases and to generate and publish bibliographies from data prepared at the national level; and (c) to maintain microfiche collections of publications that were gathered and classified by national participating centres.

Use of common methodologies

72. In a similar manner, the PADIS Central Co-ordination Office has introduced the use of relatively new and versatile document classification and analysis tools to emerging documentation centres of member States and African institutions.

Technical assistance to Economic Regional and/or Sectoral Bibliographic Information Systems

73. The Central Co-ordination Office of PADIS has been closely involved with the emergence of the Population Information Network for Africa (POPIN-Africa). PADIS has assisted in the design of the system and participated at the consultative meetings that preceded its establishment. Since its establishment, the Coordinating Unit of POPIN-Africa has benefitted from documentation tools developed at PADIS and from training provided to its staff in data base creation and management techniques.

74. Similarly, PADIS has been collaborating with the African Regional Technology Information System (ARTIS) being promoted by the African Regional Centre for Technology (ARCT). Subsequently, PADIS was a member of the interagency consultative committee for the design and establishment of the food and nutrition information system being promoted jointly by UNFSSTD, ARCT and others. PADIS is committed to provide substantive technical assistance in particular areas once the proposals/designs are off the drawing board.

75. Furthermore, the Central Co-ordination Office of PADIS is the regional co-ordinator for the development and maintenance of common indexing tools (a joint undertaking of the UN regional commissions, IDRC and others) as well as to the UNCHS Habitat information system.

Co-operation with International, Regional and Subregional Organizations

76. PADIS has entered into a number of co-operation agreements with the following international organizations within and outside the UN System: UNESCO, FAO, UNIDO, ILO, UNDIESA, ACCIS, UNDP/TIPS, UNDP/TCDC/INRES, UNFSTD, UNCHS, UNCEPAL, UN Population Division, IBI and the European Space Agency.

77. PADIS has working relations and/cooperation agreements with the following African regional and subregional organizations: ARCT, RIPS, CAFRAD, ESAMI, CILSS, POPIN, FNIS, ARSO, CODESRIA.

I. USER SERVICES

78. By far the most important user service provided by the PADIS project is the publishing of the DEVINDEX-Africa on a quarterly basis of which thirteen volumes are already published and circulated. Out of these, four were special issues that were prepared from national publications of Botswana, Guinea and Niger and from documents supplied by the World Bank. Each issue was printed in 3,500 copies and has been widely circulated in Africa, in other developing regions as well as in North America and Europe.

79. More recently, an SDI service (selective dissemination of information) has been started on data bases acquired from UNIDO and ILO. This service is being provided to 110 experts in 42 African countries.

80. The dissemination of the DEVINDEX-Africa has given rise to a number of requests from both within and outside Africa. Document delivery in Africa has mostly been in the form of photocopies while several requests from North America and Europe were for the whole microfiche collection.

81. Requests for retrospective bibliographic searches are increasingly being received.

82. The Directory of African experts and one of its supplements have also been produced and widely circulated (c. 3000 copies). Moreover, over two hundred copies of the Directory have been circulated at the request of institutional users.

PUBLIC RELATIONS

83. Various methods have been used to enhance knowledge about the objectives, activities and products of PADIS. Several articles have appeared on African newspapers, magazines, radio and television programmes; heads of state and important national and international dignitaries have visited PADIS premises; its publications have been cited in several book reviews and distributed at meetings, workshops and seminars held at Africa Hall. Equally important, the PADIS programme has been discussed at several high-level meetings. The first PADIS newsletter appeared in January 1986.

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